



BIOMIMICRY

YOUTH DESIGN CHALLENGE

2020 PROGRAM HANDBOOK
FALL 2019





WELCOME!

Thanks for being part of the Biomimicry Youth Design Challenge. We are so glad that you will be sharing biomimicry with your students this year. They will love it – and you will too! Many teachers and students who have completed biomimicry challenges have found the experience transformative and we hope you and your students will feel the same!

Design challenges are a valuable learning experience, whether or not you decide to submit your students' work to the formal competition. Through this program, students learn and model essential science and engineering practices, gain knowledge in climate and life sciences, and develop important life skills needed to succeed in school, college, and careers.

At a time of grim environmental predictions, biomimicry also presents a much-needed and hopeful message that potential solutions are all around us and empowers tomorrow's problem-solvers to think differently about nature, engineering, and the future.

We can't wait to see what your students will create!

TABLE OF CONTENTS

ABOUT	4
The Biomimicry Youth Design Challenge	4
The Biomimicry Institute	4
How to Participate in the Competition	4
How Are the Design Projects Evaluated?	5
Parental Consent and Release Notice	5
Program Assessment Notice	5
2019 - 20 YDC TIMELINE	6
BUILDING YOUR TEAM	7
Team Makeup	7
Your Role as a Coach	7
Team Advisors	8
THE LEARNING EXPERIENCE	9
Objectives	9
Program Duration	9
Needed Materials and Resources	9
Educator Resources	10
Educator Training and Support	11
THE CHALLENGE	12
The Challenge Design Brief	12
Planning your Team's Challenge	12
Additional Recommendations	12
COACH CHECKLIST	13
SUBMITTING YOUR TEAM'S ENTRY	14
Key Details	14
Submission Requirements	14
Notices	15
Submission Process	15
AWARDS AND JUDGING	16
Awards	16
Judging Process	16
Coaches' Judging Responsibilities	16
Judging Timeline	16
CONTACTS	17
APPENDIX	
Sample Parent Notification Letter	18

ABOUT



THE BIOMIMICRY YOUTH DESIGN CHALLENGE

The Biomimicry Youth Design Challenge is a flexible project-based learning experience—and competition—in which students take on the role of biomimicry innovators and imagine solutions to critical real-world problems. It was created by the **Biomimicry Institute** to introduce middle and high school students to the rapidly growing field of bio-inspired innovation while enhancing STEM education and essential life and career skills including collaboration, critical thinking, communication, and creative problem-solving. The Challenge and accompanying instructional resources are designed to be incorporated into existing STEM coursework. It can also be approached as a student capstone project, or extracurricular activity in a student club or other out-of-school program. The Challenge project is fully aligned with the Next Generation Science Standards and includes a recommended Instructional Storyline that educators can adapt to suit their needs.

THE BIOMIMICRY INSTITUTE

In 2006, Janine Benyus and Bryony Schwan co-founded the Biomimicry Institute to share nature's design lessons with the people who design and make our world. The Biomimicry Institute envisions a future in which people view nature not as a warehouse of goods but as a storehouse of knowledge and inspiration for sustainable solutions. The Institute runs the award-winning website AskNature—a free online catalog of nature's solutions to design challenges—and has helped thousands of educators to share biomimicry with their students

HOW TO PARTICIPATE IN THE COMPETITION

The competition is open to middle and high school students in the U.S. working under the guidance of an educator (their "coach") who is affiliated with a recognized school or other educational organization. Working in teams of at least two, and no more than eight, students will identify and research a design problem based on the competition theme—climate change mitigation and adaptation—and propose a bio-inspired solution. Teams will present their solutions in writing, imagery, and via a video pitch.

Coaches are responsible for registering on the Challenge website, verifying student image releases and parent permissions, and approving and uploading all submission materials to the program website by the submission deadline, **April 1, 2020**. The Biomimicry Institute additionally asks that each coach submitting a competition entry assist with the preliminary judging process by reviewing and scoring a selection of projects submitted by other coaches. This crowdsourced review process enables us to streamline judging and avoid charging a submission fee.

Refer to the Official Rules on the YDC website for complete competition eligibility information and requirements.

Please note that although we cannot accept competition entries from countries outside the USA at this time, educators everywhere are welcome to use the Challenge materials to teach biomimicry in their home countries. We hope to offer the competition globally in the near future.

ABOUT

HOW ARE THE DESIGN PROJECTS EVALUATED?

Projects submitted to the competition are evaluated based on six major criteria described in detail in the **Challenge Rubric**. The rubric is available to download from the Educator Resources page of Challenge website. A student version of the rubric, "**The Team Self-Assessment**," is also available to assist students with self evaluation. See the **Judging** section of this Handbook for more details about the awards process.

PARENTAL CONSENT AND RELEASE NOTICE

Materials submitted with a Challenge entry include documents, photographs, and video that may picture students and contain limited biographical information about them. Coaches must acquire and handle such images and information in a manner that complies with their school/organization's image and privacy policy and provide parents/guardians with the opportunity to opt out of including their student in submission materials. Coaches are responsible for ensuring that all materials they submit to the Institute via the Challenge do not picture students who have opted out.

- **Sample Parent Notification Letter**

See the appendix of this Handbook for a sample letter you can use to inform parents/guardians about the Challenge and provide them an opportunity to opt out of including their student in a submission to the competition..

Homeschool Coaches not affiliated with a legally-recognized organization must collect signed consent and release agreements from the parents/guardians of all team members, prior to engaging in Program activities. Teams that do not comply with these requirements will not be eligible for awards. Download the release forms and instructions from the YDC website and upload them when you register for the program.

PROGRAM ASSESSMENT NOTICE

The Biomimicry Institute asks that each student and teacher who participates in the Challenge (whether or not they ultimately submit a competition entry) provide feedback on their experience. Gathering data on the program helps us assess, improve, and report outcomes to funders. The Biomimicry Institute has contracted with an independent provider, Metis Associates, to conduct participant surveys and program evaluations for the Challenge.

We will ask you to participate in assessments of the program by:

- Distributing surveys to your students
- Answering questionnaires
- Participating in focus groups or short interviews.

Your participation in surveys and evaluations is always optional. The information collected will be kept confidential and combined with information from all participants in the Challenge. This data will be analyzed in bulk and individual responses will not be shared. If you have questions about the surveys or focus groups, please contact Julia Alemany at jalemany@metisassoc.com.

Thank You Gifts

We'll enter your name in a drawing* each time you complete a program assessment activity, so the more you do, the more chances there are to win.

We'll be giving away:

Second Nature documentary, with education screening license (\$100 value; three rewards available).

AskNature Bio-Inspiration Cards (\$15 value; five rewards available)

**Drawing will be held at the end of the program, approximately May.*

2019 - 20 YDC TIMELINE

NOVEMBER 1

Registration opens and
Challenge begins.

ASAP

Pre-program assessment surveys.

DECEMBER

Submission form opens.
Entries accepted until the submission
deadline.

MARCH 1

Registration closes.

APRIL 1

Submission deadline.
All entries due by 5:00 pm, PDT.

EARLY APRIL

Complete post-program surveys.
Preliminary judging phase
(approx. April 6-19).

LATE APRIL

Awards judging phase
(approx. April 24-May 7).



BUILDING YOUR TEAM



TEAM MAKEUP

Teams may form within classroom, non-formal, or after-school settings. A YDC team consists of between 2-8 students and 1 or 2 adult coaches. All teams must be affiliated with a legally recognized school or other educational organization in the United States in order to compete for awards. Teams may be comprised of students from assorted grades, however if any team member is in high school (9-12th grade), the team must submit in that category when entering the competition. Teams may also be comprised of students from assorted schools. No student may join more than one team. Coaches are welcome to work with multiple teams. If you have 8 or more students interested in joining your team, consider forming additional teams.

YOUR ROLE AS A COACH

As a coach, you will help your team learn about biomimicry, complete the challenge, and work together effectively and safely. Coaches are also responsible for communicating with the Biomimicry Institute program staff and submitting entries on behalf of the team.

An effective coach provides structure and support, but does not control the final design product or do the work. Student team members must make their own decisions and do their own work when it comes to selecting a design problem, conducting research, developing a bio-inspired solution, and preparing presentation materials.

AS A YDC COACH YOU WILL....

- **Set the stage, but don't direct the play.**
Like all project-based learning, your role is to provide your students with guidance, information, and resources with which to work and develop their ideas, not to tell them what to create.
- **Make learning fun.**
Design Challenges are exciting because they are open-ended. There's no single "right" way to solve a problem. Nature is also fascinating and organisms have all sorts of extraordinary adaptations and strategies. Encourage your student team members to be curious, go outside, embrace their creativity, and explore big ideas about what's possible if they learned from nature in their designs.
- **Assist with judging.**
In the weeks following the submission deadline, all coaches submitting entries will be asked to review a selection of student projects and score them against the **Challenge Rubric**. This 'crowdsourced' review helps us avoid charging submission fees and streamlines the awards process. It also provides you with the opportunity to see the judging process from the 'inside' to help inform your teaching in future years. Review the chapter on **Awards and Judging** for information about this process.
- **Be Flexible.**
There is no single "right" way to teach this Challenge. You will customize the problem and process to fit the interests of the students and needs of your class or program.

BUILDING YOUR TEAM



TEAM ADVISORS

While we limit a team to two official coaches, additional adults may serve in an advisory capacity for the team. In fact, we strongly encourage teams to consult with experts!

ADVISORS MAY INCLUDE:

- **Engineers**
Advise on technological aspects of the design or prototype.
- **Biologists and naturalists**
Help identify possible sources for inspiration and explain scientific concepts related to how biological strategies work.
- **Design professionals**
Lead brainstorming or ideation activities; provide constructive feedback on design concepts or prototypes; advise on the design of presentation materials.
- **Climate change experts**
Help teams and coaches understand the science of climate change and current and predicted impacts (globally or in your region); help teams identify 'leverage points' for innovation where new ideas can have a big impact.
- **Biomimicry practitioners**
Help teams and coaches learn and apply a biomimicry design process.

SOURCES FOR PROSPECTIVE ADVISORS MAY INCLUDE:

- **Local colleges and universities**
Faculty, researchers, and graduate students in departments that specialize in life sciences, engineering, design, environmental studies, and climate.
- **Local organizations**
Environmental and sustainability organizations, museums and nature centers, etc.
- **Companies in your community**
Many companies encourage their employees to volunteer. Firms in your town that work in engineering, architecture/design, or environmental consulting could be resources for advisors.
- **Parents and relatives of team members**
- **Biomimicry Global Network**
The Biomimicry Institute maintains relationships with 36 regional network groups in 21 countries. The members of these groups are often eager to support biomimicry practice and teaching in their regions. Visit biomimicry.org/global-networks to find out if there is a regional network in your area and how to contact them.
- **AskNature**
The Biomimicry Institute's AskNature database connects a global community of people interested in or practicing biomimicry. Once you create an account, you can search the Member Directory for individuals located in your area. Visit asknature.org for more details.

THE LEARNING EXPERIENCE

The Challenge and accompanying instructional resources are designed to be incorporated into existing STEM coursework, but it can also be approached as a student capstone project or extracurricular activity in a student club or other out-of-school program. The Challenge project is fully aligned with the Next Generation Science Standards and includes a recommended Instructional Storyline that educators can adapt to suit their needs.

OBJECTIVES

STUDENTS WILL:

- Describe how structures, processes, and systems in nature have inspired humans to create innovative designs.
- Experience a design process that blends design thinking, engineering, and biomimicry.
- Define a real-world problem and identify criteria and constraints.
- Gather and apply scientific information from credible sources.
- Identify a biological model for design inspiration and describe how its traits perform a beneficial function.
- Collaborate to create a biomimicry solution, inspired by a biological model.
- Demonstrate science and engineering practices and an understanding of STEM concepts.
- Collaborate to present what they designed and how they designed it to an authentic audience.
- Defend how their solution contributes to addressing a global climate issue.

PROGRAM DURATION

The YDC can be taught as a concentrated unit or as an ongoing project spread across existing coursework. Within the Challenge framework, there are numerous opportunities to extend and customize the program with connections to specific science concepts, community issues, and teaching objectives that pertain to your course or program. Depending on how these activities are scheduled, and the depth you wish to go in conceptual learning and design development, the length of the project could vary from a few weeks to a semester or longer. Refer to the Instructional Storyline for suggested lesson planning and resources.

NEEDED MATERIALS AND RESOURCES

If your team is school-based, the school itself can often provide many of the resources needed to participate in the YDC. For teams not based in school, you may need to make special arrangements with your hosting organization to acquire the following basic needs:

- **Meeting space** for team members to regularly work together and with their coach(es).
- **Computer** and software with which to develop the challenge entry.
- **Internet access.** Team members will use the internet to conduct research. Coaches will need internet access to download Challenge materials, receive emails, and keep up to date as the Challenge progresses.
- **Camera** to capture photos from the design process, document models or prototypes, and to take a team photo to accompany the Challenge entry.
- **Video recorder and editing software.** A short video pitch is a required component of the challenge entry. A smartphone is often sufficient to capture video and there are a variety of free or low-cost video editing apps available.
- **Office supplies and modeling materials** for brainstorming, prototyping, etc. Large sheets of paper, markers, and sticky notes are all quite useful. Modeling materials needed will vary based on what the team wishes to prototype.
- **Access to a natural area.** While not strictly required, we strongly encourage teams to spend time outdoors observing nature for inspiration!

THE LEARNING EXPERIENCE



- **Connecting the UN Sustainable Development Goals to Climate Change**

The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations to promote prosperity while protecting the planet. This resource highlights connections between the UN SDGs and climate change (causes and impacts). Links to sources for additional information are provided for each relevant goal

- **UN Sustainable Development Goals Aligned to NGSS**

This resource identifies the goals that are relevant to the YDC and aligns them to Disciplinary Core Ideas in the Next Generation Science Standards. You can use this guide to narrow the climate change theme to a more specific design problem and identify curriculum connections. There are at least two ways to do so:

1. Choose an SDG that aligns with the content of your class or program before introducing the Challenge to the students. The problem and design project students undertake will then arise from this SDG.
2. Have students review several SDGs, with your guidance, and choose one for their problem and design project.

- **Framing the Climate Challenge**

Climate change is a complex topic so it is essential that you guide your team in selecting a specific aspect of the challenge to focus on. This portion of the YDC website outlines a few ways you might approach narrowing the Challenge with your team if you choose not to use the provided Instructional Storyline.

- **Team Self-Assessment**

This variation on the Challenge Rubric can be used by student teams to check that their project and materials have addressed all the requirements of the Challenge.

EDUCATOR RESOURCES

The Youth Design Challenge is structured to allow educators to shape the experience to best serve their setting, goals, and their students' interests. The resources listed below are provided to assist you in designing the learning experience. We encourage you to use whichever resources are most appropriate for your needs. **Log in and visit the Educator Resources page on the YDC website to access all support materials.**

★ NEW THIS YEAR

- **MIMIC Instructional Approach**

A visual framework showing the key components of a biomimicry project. Use it as a guide to the most essential components you should plan to include in any biomimicry design challenge learning experience.

- **Instructional Storyline: "Creating Local Biomimicry Solutions to Global Problems"**

Based on the MIMIC Instructional Approach, this storyline provides a blueprint for overall project and unit planning for a Challenge focused on connecting local issues with global climate impacts through the UN Sustainable Development Goals. The Storyline includes suggestions for lesson sequences, activities, and resources that will prepare students to enter the Challenge.

THE LEARNING EXPERIENCE

OTHER RESOURCES

• Design Brief Handout

The Design Brief describes the overarching problem that student projects need to address to compete in the Challenge: **climate change mitigation and adaptation**. This copy is formatted as a one page handout you can distribute to student teams, if desired.

• Challenge Rubric

The rubric articulates the criteria that judges use to evaluate entries and select award winners. You can share this with student teams to help them understand the quality of work that judges will look for when selecting award winners.

• Introducing Biomimicry

We've gathered some suggestions along with our favorite resources for introducing teachers and students to biomimicry on the Introducing Biomimicry page of the YDC website. These resources complement the resources and lessons listed in the "Motivate" section of the Instructional Storyline.

• Climate Change Resources

We've gathered a selection of our favorite resources on the Climate Change page of the YDC website. These resources are an addition to the lessons and resources in the Instructional Storyline that can give students a basic understanding of this complex issue.

• Legacy Biomimicry Design Challenge Curriculum*

This curriculum module contains 7 lessons that walk students through a design thinking process anchored in biomimicry. This module focuses solely on the design task, so you will need to plan additional instruction for introducing biomimicry and the climate change challenge. Portions of this module have been adapted for use in the new Instructional Storyline listed above.

**NOTE: This curriculum was written before the Youth Design Challenge had been developed. References within the curriculum to the Biomimicry Global Design Challenge are no longer relevant. Please refer to this handbook and the Youth Design Challenge website for current program details.*



EDUCATOR TRAINING AND SUPPORT

To support you in your biomimicry journey, we provide training and support opportunities for educators.

TRAINING VIDEOS

Short videos that will help you build your knowledge in biomimicry and best practices for facilitating project-based learning experiences. These videos can be found from the **Educator Resources** page of the YDC website.

WEBINARS

Periodically throughout the year we will host online gatherings to address specific topics, share experiences, and troubleshoot together. The dates and details of these events will be sent out by email to all coaches in advance. Webinars will be recorded and archived. A link to the archive can be found on the **Educator Resources** page.

INDIVIDUAL SUPPORT

If you have a question that cannot be answered through the online resources, we are available to help. Contact us at youthchallenge@biomimicry.org to request a 10-minute consultation call.

PROFESSIONAL DEVELOPMENT WORKSHOPS

We can provide in-person professional development workshops for educators, focused on biomimicry and the Youth Design Challenge. Contact us if your school or organization would like to schedule a training.

THE CHALLENGE

THE CHALLENGE DESIGN BRIEF

A “design brief” is a document that describes a design project. Designers and engineers use design briefs (also sometimes called ‘problem statements’) to make sure that everyone on the project team has a shared understanding of what problem they are trying to solve, and the scope and goals for possible solutions.

The **YDC Design Brief** introduces the overall focus of the Youth Design Challenge: **climate change mitigation and adaptation**. How clearly team design projects address the problem described in the design brief is an important criterion on which they will be evaluated. The brief is available on the YDC website and can be downloaded as a handout you can share with students.

PLANNING YOUR TEAM’S CHALLENGE

The YDC Design Brief is written broadly to provide educators with flexibility and to encourage diverse and creative solutions. However, climate change is a vast and complex topic and it will be essential that you guide your team in selecting a specific aspect of this challenge to focus on.

Defining a design problem is a valuable educational part of this project. It helps improve students’ capacity to break large problems into smaller, more manageable ones, and it can help students apply critical and systems thinking to problem solving. Depending on your setting, learning goals, and student population, you may want to direct this “problem definition” aspect of the Challenge to a greater or lesser extent at the outset of the project. You can narrow the scope of the Challenge in a variety of ways to make the challenge more accessible and/or to target specific academic concepts. Just remember, it’s important to make sure that students still have a voice and choice in defining the specific problem they will solve.

The **Instructional Storyline** “Creating Local Biomimicry Solutions to Global Problems” provided in the YDC Resources offers a framework for narrowing the Challenge by focusing on the UN Sustainable Development Goals and connecting them with local issues. For additional suggestions on ways to narrow the challenge for your students (or help them in doing so), refer to “Framing the Climate Challenge” on the Educator Resources page

ADDITIONAL RECOMMENDATIONS

After running design challenges for many years, we’ve noticed a few pitfalls that sometimes trap those new to biomimicry. We mention these here so that you can help your students avoid them and submit a strong entry to the competition.

Distinguish between biomorphism, bioutilization, and biomimicry: “Biomorphism” refers to an object that looks like something from the natural world (from the Greek “morph”, meaning “shape”). “Bioutilization” refers to using natural materials. Both biomorphism and bioutilization can occur in biomimicry, but their presence alone does not make a design biomimetic. The important indicator is function—whether a design “works like” a strategy in the natural world. Make sure students are focusing on function in their designs, not just using, or superficially resembling, biological elements. For a deeper discussion of these terms see our publication, *Sharing Biomimicry With Young People* (p. 12), available on AskNature.org.

Stay out of the ‘solution space’ until you’ve completed your research: Sometimes a design problem can spark ideas for possible solutions right away, before we even get to researching biology. When this happens, it’s tempting for the design team to “jump to the solution space” and spend more of their time looking for justification in nature for an idea they already have, instead of following the biomimicry design process faithfully to investigate new sources for ideas. It’s often pretty obvious to our judges when this happens, because the depth of emulation and learning from nature is weak. Encourage your students to stick with the process and really investigate what can be learned from nature before jumping to conclusions about possible solutions.

Focus on generating new ideas or improving existing ones: As news stories and information about biomimicry have spread, many case studies and biological models have become popular. It can be very tempting to students to recycle these ideas instead of finding and developing their own. Encourage your students to go deeper in their research and, if referencing an existing technology or a frequently-used biological model, prompt them to add their own insights or original ideas to their designs.

COACH CHECKLIST

Below we have provided a checklist of essential tasks and activities to help you and your team stay on track during the Challenge. Please keep in mind that this checklist is not exhaustive and is only intended as a starting point.

COACH'S PREPARATION

- Register as a coach for the Biomimicry Youth Design Challenge and download the Program Handbook. (If you are reading this, you've probably already completed this step!)
- Build your team of 2-8 students and up to 2 coaches.
Coaches may supervise multiple teams.
- Distribute the student pre-program surveys.
- Review the Design Brief and Challenge Rubric.
- Review the YDC Educator Resources and determine how you would like to use them to support your team

COMPLETING THE CHALLENGE

- Introduce your team to the topics of biomimicry and climate change.
- Review the design brief and Challenge Rubric and discuss it with your team. Revisit these documents as needed throughout the design process to keep your team on track.
- Support your team through the process of defining a specific climate change problem to focus on for their Challenge project.
- Support your team through the process of researching biological models.
- Support your team through the process of developing solutions for their selected design problem, inspired by the biological models researched.
- Support your team in preparing the submission materials according to Challenge requirements and the Challenge Rubric. Enter your team submissions via the online form and finalize them by the deadline.
(Coaches may work with multiple teams, but please only enter your three best submissions.)
- Distribute the student post-program assessment survey and complete the coach post-program survey.

JUDGING

- Review the judging info pack, rubric, and tutorial videos
- Review and score team submissions via the online platform, following the provided instructions.
- Complete the post-judging survey.

OPTIONAL ACTIVITIES

- Attend periodic online training and support sessions, when available.
- Identify experts in your community who can serve as advisors to your team.
- Plan a field trip to a local nature area, natural history museum, zoo or aquarium to allow your students to see inspiring organisms in person.
- Make arrangements to present your team's finished project to your school, community, or other stakeholder group.
- Participate in interviews and focus groups with the Biomimicry Institute and other coaches to help refine the YDC.
- Organize an end-of-Challenge celebration with your team.

SUBMITTING YOUR TEAM'S ENTRY

Congratulations! Your team has developed a bio-inspired design solution and now it's time to enter it into the competition. Here's what you need to know to submit your entry. For more details and legalese, we recommend reviewing the Official Rules on the YDC website.

KEY DETAILS

- Coaches are responsible for submitting their team's final competition entry. Student team members do not directly submit work to the Challenge.
- If a team has two coaches, one of them shall be designated "lead coach" for the purposes of submitting the entry.
- To keep the judging process manageable, only three submissions will be accepted per coach. If you are working with several teams please select the strongest candidates to submit to the competition. Choosing them yourself, having the class vote, or hosting an event and inviting guests to judge the entries are a few ways you can select teams to enter.
- Complete one submission form for each team entering the Challenge.
- Entries are accepted ONLY via the submission form on the YDC website. Do not email submission materials.
- Entries must be received via the Challenge website by the posted deadline.

SUBMISSION REQUIREMENTS

Entries must employ biomimicry (nature-inspired innovation) in addressing a social and/or environmental issue that is related to climate change, as described in the Design Brief. As discussed on page 12, this broad theme should be narrowed and focused on a specific problem that can be addressed by a design solution. Visit the "Framing the Climate Challenge" page on the YDC website for additional guidance.

ENTRIES MUST CONSIST OF THE FOLLOWING:

All submission materials will be typed or uploaded to an online submission form.

• Project Overview

Teams must supply written answers to the following three questions, which may be displayed in a gallery of submissions on the Challenge website:

- What is the problem your team addressed for this challenge and how is it related to climate change? (100 word limit)
- What does your design solution do? How does it solve or improve the problem you selected? (100 word limit)
- How was your solution inspired by nature? What organisms did you learn from and how did what you learned inform your design? (100 word limit)

• Video Pitch

The video (max two minutes in length) should provide an engaging overview of the design project and the problem it solves, explain how it is inspired by nature, and convey key discoveries or insights from the design process. Creativity is encouraged! The video must be uploaded to a video sharing website and made available for public viewing. (Vimeo (preferred) or YouTube.) The submission form will collect a link to the video. The video may be displayed in a gallery of submissions on the Challenge website.

• Project Portfolio

A document (PDF file, no more than 14 pages long) that uses narrative and images to tell the story of your team's biomimicry design and process for developing it. Pages should be letter size (portrait or landscape), or PowerPoint slide size. A title page/slide should include, at a minimum, your team's school or organization, grade level, and team members names. Include a references page/slide for all sources, image credits, and any experts consulted.

SUBMITTING YOUR TEAM'S ENTRY

• Project Image

A drawing, diagram, or photograph (with a caption) that clearly portrays the design solution. This image will be displayed in a gallery of submissions on the Challenge website. The image must be provided in JPG file format and no smaller than 1500px by 1000px. To display well in the gallery the image should be in landscape (horizontal) format.

• Team Photo

An image depicting all team members and (optionally) their coach(es). This image will be displayed in a gallery of submissions on the Challenge website. The image must be provided in JPG file format, and no smaller than 750px by 500px.

NOTICES

COPYRIGHT AND INTELLECTUAL PROPERTY

When you submit your team's entry, you will check a box to verify that the entry is the original work of the team members listed on the submission form. Doing so confirms that the entry is free of copyright infringement. If any copyrighted materials are used in the submission, they must be properly credited and follow U.S. Fair Use guidelines. This resource from the University of Texas offers more information about U.S. copyright and Fair Use qualifications: *Copyright Crash Course: Fair use of copyrighted materials*.

Entrants retain ownership of all ideas and materials/images submitted to the Challenge. However, by submitting an entry, teams grant the Biomimicry Institute the right to display submitted entry materials on the Challenge website and to use such materials (with appropriate attribution) for educational purposes and promotion of the program. See the Official Rules on the YDC website for complete conditions of entry.

IMAGE RELEASES

When you submit your team's entry, you will check a box to verify that all images contained in the submission were acquired in a manner that complies with your organization's image release policy and do not include any students who have opted out of being pictured or otherwise identified.

SUBMISSION PROCESS

Once you have been notified that the submission form is open:

- Log into the Challenge website. You will be redirected to the Details page.
- Click the "Start a Submission" button from this page or your "My Submissions" page (accessed in your user dropdown menu).
- Enter the required information on the submission form.
- In addition to the submission materials, you will need to provide team information including the names and contact info for all coaches, the team's host school or organization, and the names and grades of the student team members.
- The submission form can be saved as a draft and returned to at any time by going to your "My Submissions" page (accessed in your user dropdown menu). Draft entries will display a blue icon (in progress) in the list. To edit or delete a draft, select the appropriate option from the "Actions" menu next to the entry.
- Preview and submit the entry for judging by clicking the appropriate button on the submission form. Once submitted, entries can no longer be edited.
 - Submitted entries will display a "pending" icon in the "My Submissions" list. You will also receive an email confirmation that your submission was received.
 - Our staff will review the entry for completeness; This may take several days depending on the volume of submissions. You will receive another confirmation email once it has been approved for judging.
- If you have multiple teams to submit entries for, simply repeat this process for each one (for up to three entries). A new draft will be created each time you click the "Start a Submission" button.
 - Note: We recommend working on one submission at a time. A system error may be triggered if you have more than one copy of the submission form open at one time (e.g. in multiple browser tabs).

AWARDS AND JUDGING

AWARDS

Entries to the competition are judged once annually and prizes are awarded in two grade level categories: middle school (6th-8th) and high school (9th-12th). In each category a 1st, 2nd, and 3rd place award will be given.

Projects selected for awards will receive:

- Recognition in a gallery on the Youth Design Challenge website, on the Biomimicry Institute website, and in media and outreach from the Biomimicry Institute.
- An Award Certificate for each member of the winning team.
- A cash award in the following amounts: 1st Place - \$1,000; 2nd Place- \$750; 3rd Place - \$500.

Winners will be notified via email to the coaches, and provided with instructions for claiming the award. Award funds will be disbursed in the form of a lump sum check addressed to the school or organization with which the team is affiliated. The Biomimicry Institute will not disburse award funds directly to students or private individuals. Please refer to the Official Rules on the Challenge website for complete award conditions.

JUDGING PROCESS

Entries are judged in two rounds of review. (See the timeline for approximate dates.)

• Preliminary selection

All eligible entries will be scored based on a numerical point system correlated to the Youth Design Challenge rubric. Coaches serve as judges during the preliminary round. Each entry will be scored multiple times and the scores averaged. The top ten entries by score from both the middle school and high school categories will advance to the final round.

• Awards

Award winners will be selected by a panel of judges comprised of Biomimicry Institute staff and selected biomimicry subject matter experts.

COACHES' JUDGING RESPONSIBILITIES

To streamline the judging process and avoid charging submission fees, coaches with teams entering the competition are asked to be part of the preliminary round by reviewing a selection of submissions from other coaches. Judging is a great opportunity for you to see other teams' solutions and become more familiar with the Challenge Rubric, both of which can help improve your coaching in future years.

All judging will be completed online. Coaches will be provided with access to the web-based judging platform soon after the submission deadline and assigned a selection of entries to review and score. We anticipate each judge will need to review 4-6 entries, to be determined based on the number received.

EXPECTATIONS OF JUDGES

- 1. Carefully review** the provided judging info packet, rubric, and tutorial videos.
- 2. Evaluate the submission** materials for each entry assigned to you and score them according to the instructions provided.
- 3. Leave constructive comments** to each team reviewed in the appropriate space on the online scorecard. *Your comments will be shared with the team's coach anonymously.*
- 4. Disclose any conflicts of interest**, such as judging your own students or others at your school, so we can reassign entries if needed.
- 5. Complete a post-judging survey** (to be emailed upon completion of judging).

JUDGING TIMELINE

Submission deadline:	April 1
Receive judging info packet:	April 6*
Preliminary judging by coaches:	April 6 - 19*
Final judging for awards:	April 24 - May 7*
Awards announced:	ASAP after May 7*

**Judging dates are subject to change*

CONTACTS



YDC PROGRAM SUPPORT

YOUTHCHALLENGE@BIOMIMICRY.ORG

Contact us if you are having problems using the YDC website, submitting your entry, or have questions that cannot be addressed in the public forum above.

SURVEYS & PROGRAM EVALUATIONS

The Biomimicry Institute has contracted with an independent provider, Metis Associates, to conduct participant surveys and program evaluations for the Biomimicry Youth Design Challenge. If you have questions about surveys or focus groups you have been asked to participate in, please contact Julia Alemany at jalemany@metisassoc.com.

IMAGE CREDITS

Cover: By Erin Drago Photography/Stocksy

Pg 2: CC BY-NC-SA 2.0 by ZombieLawyer

Pg 4: By Flickr User US Embassy

Pg 6: From Getty Images

Pg 7: Photo courtesy of Team Prairie Dawgz

Pg 8: By Flickr User Sporadice1

Pg 10: CCbyNC-SA by North Cascades National Park

Pg 11: By Shutterstock

Pg 17: From Princeton University

APPENDIX

SAMPLE PARENT NOTIFICATION LETTER

Modify this letter as needed to suit your school/organization by copying and pasting it into a document and adding/editing the appropriate info to the highlighted sections.

DATE

Dear Parent/Guardian,

This year **SCHOOL/ORGANIZATION NAME** will be participating in the Biomimicry Youth Design Challenge. The Challenge is a creative project-based learning experience and design competition hosted by the Biomimicry Institute. Biomimicry (nature-inspired design) is a rapidly growing field of study that is charting the course toward a more sustainable world and creating exciting new STEM career pathways for scientists and innovators. You can find more information about the Challenge on the program website: youthchallenge.biomimicry.org.

As part of the Challenge, your student and his/her teammates may have the opportunity to submit a project to the national competition. Submission materials include images and videos that may picture your student. These images and video may be displayed on the Challenge website and used by the Biomimicry Institute for educational purposes and/or to promote the Challenge. All images will be acquired and handled in a manner that complies with **SCHOOL/ORG NAME** policy. Limited biographical information (participant's name, grade, school, city, state, and gender) will also be collected with the entry and may be shared publicly with the exception of gender, which is collected for Challenge evaluation purposes only. Refer to the Official Rules on the program website for complete details. If you consent to including your student in a submission to the Challenge, no action is required. If you do not want your student's image or information to be included, fill out the bottom of this letter and return it to me.

To assist the Biomimicry Institute's efforts to evaluate learning outcomes, we may also distribute surveys to students. All surveys are confidential and students can opt out and/or refuse to answer any question. If you do not want your student to participate in the surveys, please tell them not to fill them out. For more information about the survey you may contact the program evaluator, Julia Alemany (jalemany@metisassoc.com) or by calling (877) 638-4568.

If you have any additional questions or concerns, please contact me at **CONTACT INFO**.

Thank you,

NAME
TITLE/ROLE, ORGANIZATION

.....

CHALLENGE SUBMISSION OPT OUT

I do not want my student's image and information included in a submission to the Biomimicry Youth Design Challenge competition. I understand this may mean that s/he will not be publicly credited for his/her work on a team project.

Student's Full Name (printed): _____

Parent/Guardian Name (printed): _____

Parent/Guardian Signature: _____ **Date** _____