

EXPLORE
STEM
CHALLENGE

RULE BOOK

2026



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Introduction

“Worthy are you, our Lord and God, to receive glory and honor and power, for you created all things, and by your will they existed and were created.” Revelation 4:11 (ESV)

Welcome to the Answers STEM Challenge hosted by Answers in Genesis! The Answers STEM Challenge exists to give young adults ages 14–18 an opportunity to collaborate in a friendly competition while learning about a STEM topic from a biblical worldview. This is a one-day hands-on design competition where participants are presented with a design task related to a STEM topic. Each participating team will create a design that will be evaluated by a panel of experts, and the top three winning designs will be awarded a monetary prize. Participating young adults will also hear from keynote speakers that love God’s Word and are experts in or related to the topic of the design challenge.

The challenge will take place in the Answers Center located at the Ark Encounter in Williamstown, Kentucky. The challenge will occur the day prior to the free Creation College Expo event that is also hosted by Answers in Genesis at the Ark Encounter. We encourage participating teams to stay for the free Creation College Expo during the days following the STEM challenge to learn more about Christian institutions across the country who hold to biblical authority and young-earth creation. To learn more about the free Creation College Expo, visit: CreationCollegeExpo.org

Participation

All young adults ages 14–18 are welcome to participate in the Answers STEM challenge. All members must be between the ages of 14–18 on the day of the competition to be eligible to enter as a team in the challenge. Teams can be comprised of 2 to 4 members but cannot exceed a maximum of 4 members. Each team is required to have an adult coach (21 years or older) to enter. Please note, the coach is responsible for the supervision, management, and registration of their team.

Registration

Teams can register and find additional details for the cost of registration at the Answers STEM website: GetAnswers.org/stem

Challenge

Each year, participants will be presented with a design challenge related to a topic in the STEM field. Teams are required to design their project following the stipulations outlined in the [Design Rules](#) section of the rule book. Each team’s design will be evaluated by a panel of experts that will judge the designs by the outlined criteria in the [Design Evaluation](#) section of the rule book.

For the 2026 Answers STEM Challenge, participants will be tasked with creating a balsa tower to be tested under earthquake conditions.



Throughout history, God has commanded people to build. From ancient constructions like the ark during the global flood (Genesis 6:13–22) to modern technology like the smartphone, humans have achieved amazing feats in architecture and design. While humans have made incredible things, God is the ultimate Creator. Many engineers have been inspired by designs they see in the natural world and imitate God’s design in their constructions. Mimicking God’s design from living things is called biomimicry. Airplanes are often modeled after bird flight, Velcro was invented because burrs from plants were sticking to clothes and pets, and even bridge builders get inspiration from ants! Army ants can fill in gaps with their bodies and build “living” bridges that other ants use to walk across! Towering trees and other natural structures have inspired the builders of many different buildings, but with height comes many dangers. Tragedy has resulted from poor design and triumph from excellent design.

We also see God’s provision when people make constructions for the glory of God, such as Noah’s ark (Genesis 6:18), as well as God’s discipline when people construct for their own glory rather than God’s, such as with the tower of Babel (Genesis 11:8). The 2026 STEM challenge balsa tower design task will provide a unique opportunity for teams to apply these biblical principles when considering the design of their towers. As humans take dominion over the earth and multiply and fill it, building tall structures is a natural part of using areas with limited land in an efficient ways. Materials and designs have changed over time, and your challenge is to use balsa and another material to construct a tower that is the strongest for its weight. Our prayer is that this challenge would encourage and equip teams to stand on the authority of God’s Word when presented with construction projects and the benefits they can bring to all of mankind.

Equipment

All 2026 balsa tower designs must include the following components:

- 1/8" square balsa strips (not basswood)
- A material bonded to the wood as a composite material
- Adhesive applied at the joints

All materials for building the tower will be supplied by the team. You may seek sponsorships and cooperation from people and groups within your community, but it is the responsibility of the team members to design and build the tower under the guidance of the adult coach.

We encourage creativity and experimentation for the tower construction. Teams should incorporate a non-metallic composite component (e.g., 3D-printed materials, fiberglass, string) into their tower. However, the composite component should not exceed more than 20% of the tower construction materials by weight. Please be aware that if any material used appears to be unsafe (see [Design Rules](#)), the panel of experts will disqualify the tower from the challenge. Materials should be, to the greatest extent possible, built by the team to meet the needs of their design and manufactured to those specifications, not purchased as a kit to be assembled.



Design Rules

Dimensions and Materials

Participants will place their constructed tower on a shake table. The shake table is a commercially available device that provides variable horizontal and vertical movement of the base, simulating an earthquake

Each team's tower will need to have a removable baseplate of no more than 12 mm (approximately 1/2 inch) thick that is between 20–30 mm square (approximately 8–12 inches).

The base/legs of the tower may NOT be embedded into the baseplate. Instead, you should devise a mechanism to attach your tower to the baseplate. The baseplate and attachment mechanism will NOT be part of the weight of your tower. This will allow you to test various designs on the same baseplate and for your tower to be weighed by itself on the day of competition.

The tower mass should not exceed 80 grams including the composite material but not including the baseplate or attachment apparatus.

Tower Dimensions

Towers should be constructed with an equal width on both sides of the base, but the upper section and platform may be smaller than the lower.

Minimum Base Width: 200 mm x 200 mm

Height Range: 400–450 mm

Tower Materials

1. Towers must be constructed of 1/8" square balsa wood (not basswood) members for beams.
 - a. The balsa wood may be notched, cut, sanded, or laminated in any manner but must still be identifiable as balsa wood.
 - b. Any commonly available adhesive may be used at the joints.
 - c. The tower must include two platforms: The first must be at least 10 cm above the base; the second should be at the top.
 - i. Each platform should have a gap or hole of at least 8 mm at its center to accommodate a washer and bolt that will be used to secure the weights.
 - d. Total weight of the tower including all components should not exceed 80 grams.



2. Composite materials should be incorporated into the design as gussets, laminated segments, or other linking elements, but may not serve as main beams/members of the tower.
 - a. Materials such as fiberglass, plastics, 3D-printed plastics/synthetics, or similar elements are acceptable.
 - b. These materials should not constitute more than 20% of the weight of the tower. (Include a photo or other verification in the presentation.)
 - c. You may NOT use any metallic components in the tower design.
3. Towers should NOT be painted, coated with glue or epoxy, or have paper on the joints (unless that is your composite material).

Design Evaluation

A panel of experts will evaluate all participating teams the day of the challenge. Evaluation will occur in two ways. Each team will be required to test their design as well as present their design to the panel of experts. The strongest tower will not necessarily win the competition.

Team Testing

Teams will be required to weigh their towers and then place their towers to be tested on a shake table. Your tower must be designed to accommodate attachment to the shake table. The panel of experts will evaluate the tower design using the criteria in the rubric, evaluating the structure, use of materials, and incorporation of the composite material. The tower will then be tested by measuring the load bearing capacity under stress conditions. Weight will be added to the platforms and shaken for 20 seconds. Additional weights will be added until the judges determine a failure has occurred (broken member, separated parts, etc.) Decisions of the judges are final.

Addition of weights and energy

To test the strength of the structure, weighted plates will be added to the lower and upper platforms. The plates will be 6 mm (¼") plate steel approximately 100 mm square with a hole in the center to accommodate a 6 mm bolt and washer for securing the plate to each platform. The first stage will be one plate on each platform. Each successive stage will add a plate to each platform until four plates are on each platform.

The efficiency of the tower will be used in the scoring:

Efficiency = load supported x time sustained / mass of tower

Refer to the video posted on the event page to familiarize your team with the testing setup and procedure.



Team Presentation

All teams are required to present their design to the panel of experts through a poster or digital presentation. If you are using a digital presentation, you must bring an HDMI-compatible device to connect and present from. All presentations must not exceed five minutes and must include the following (but not necessarily in this order):

1. Design process of the tower, including the truss/beam pattern or inspiration for the style.
 - a. Include a verification of the mass of your composite material with respect to the total mass of your tower with a photo or video.
2. Team communication and collaboration.
3. Demonstration of an understanding of the laws of nature and forces involved in the engineering of the tower.
4. Application of a biblical worldview to the design and operation of tower structures under stress.

Evaluation Rubric

Your team’s design will be evaluated in three categories (design, testing, and presentation). Please see the descriptions below for further details regarding each rubric category.

Design Evaluation Categories	Further Details
Craftsmanship	Random materials were not thrown together—team used organization and attention to detail with quality of construction.
Proficiency	Design demonstrated a knowledge of tower architecture and function.
Creativity and innovation	Design showed originality and ingenuity in integrating a composite material.



Tower Testing Categories	Further Details
Functionality	Tower supported weight during the stress table test and would function as an actual tower.
Efficiency	Tower demonstrated strength for weight.
Structurally sound	Tower withstood the testing with little damage to the structure and demonstrated stability even after failure.

Presentation Categories	Further Details
Described design process with adequate detail, including introduction, methodology, and conclusion	Details of the design process were clearly laid out and had a logical flow.
Communication and team collaboration clear and concise	Team demonstrated that they worked together and their presentation was well thought out and organized.
Demonstrated knowledge of tower engineering science	Team clearly indicated how they thought out and applied real-world scenarios to their design and an understanding of natural laws and applied forces.
Application of biblical worldview to the design task	Team showed the importance of standing on the authority of God's Word and appropriately applied biblical principles to tower construction and operation.

Answers STEM Challenge Judging Rubric

Team Name: _____

Tower Mass: _____

Composite Mass: _____

Load Mass: _____

Efficiency: _____

Overall Score: ___/50



Judges will place a mark in the box that best describes each category.

Design Evaluation Categories	Poor (1)	Average (2)	Good (3)	Very Good (4)	Excellent (5)	Total
Craftmanship						
Proficiency						
Creativity and innovation						
						/15

Tower Testing Categories	Poor (1)	Average (2)	Good (3)	Very Good (4)	Excellent (5)	Total
Functionality						
Efficiency						
Structurally sound						
						/15

Presentation Categories	Poor (1)	Average (2)	Good (3)	Very Good (4)	Excellent (5)	Total
Described design process with adequate detail, including introduction, methodology, and conclusion						
Communication and team collaboration clear and concise						
Demonstrated knowledge of tower construction						
Application of biblical worldview to the design task						
						/20



Awards

Presentations that do not include a clear, biblical worldview connection will not be eligible for prizes. See the website for a current list of prizes.

[GetAnswers.org/stem](https://www.getanswers.org/stem)



Resources

Incorporating a Biblical Worldview

To ensure that you have access to resources that can help you incorporate a biblical worldview into your presentation, here are links to articles that may assist you in showing how your project connects to God's Word and the foundation of natural laws and science.

- Biomimicry: [AnswersInGenesis.org/technology/biomimicry/](https://www.answersingenesis.org/technology/biomimicry/)
- God's living girders: [AnswersInGenesis.org/human-body/bones/](https://www.answersingenesis.org/human-body/bones/)
- The nature of science: [AnswersInGenesis.org/what-is-science/](https://www.answersingenesis.org/what-is-science/)
- Ark engineering: [AnswersInGenesis.org/noahs-ark/could-wooden-ark-survive-flood/](https://www.answersingenesis.org/noahs-ark/could-wooden-ark-survive-flood/)

Sources for Materials

Balsa sticks can be purchased at local craft and hobby stores or at many online stores. Below are links to online retailers you may use, but minimum orders are required:

[NationalBalsa.com/products/181824](https://www.nationalbalsa.com/products/181824)

[BalsaTron.com/products/1-8-x-1-8-x-36-balsa-stick?variant=48108744605978](https://www.balsaTron.com/products/1-8-x-1-8-x-36-balsa-stick?variant=48108744605978)

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