

KANSAS ENERGY PROGRAM



2027 Kansas KidWind Challenge Rule and Guide Book



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*This document includes the rules and logistics for how the 2027 Kansas KidWind Challenges will be operated.
Questions? Contact the Kansas Energy Program (KEP) at ksenergyprog@ksu.edu or 785-532-6026.*

Changes for the 2027 Challenge

There are minimal changes for the 2027 season. To make them easier to find, any changes beyond formatting or slight edits are highlighted in **green**.

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What is the KidWind Challenge?

KidWind is a STEM competition for 4th-12th graders where student teams design and build a working wind turbine. Teams bring their turbine to a regional KidWind Challenge to test their turbine's performance and present their work to judges, along with completing a quiz and instant challenge. Winning teams advance to State and World competitions. [Click here](#) for a 3-minute video overview.

Based on 2026 KidWind teacher/coach feedback, students gain many skills beyond knowledge of energy by participating in the KidWind Challenge (see Figure 1 below).

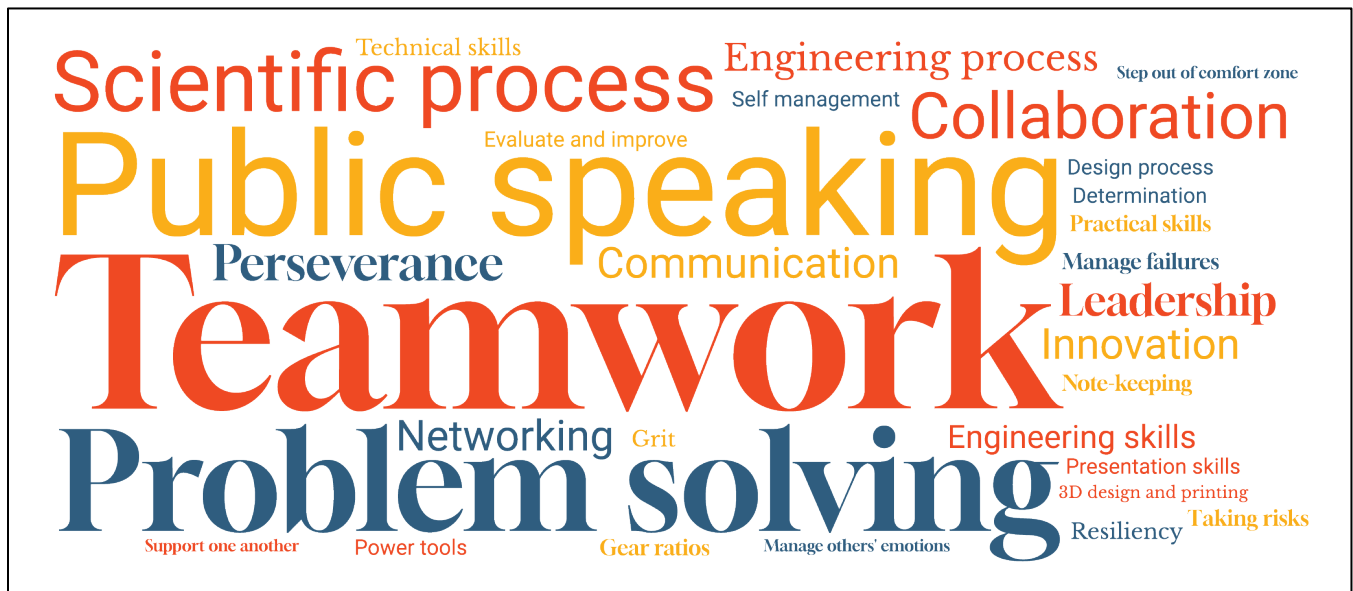


Figure 1: What students learn through KidWind (based on 2026 KidWind teacher/coach feedback)

Eligibility

Any group of students in grades 4 to 12 is eligible to enter a team, including students from public and private schools, home-schooled students, after-school clubs, Scout troops, etc. As long as you have a coach and a team, you can attend!

In the event of a mixed-age team (a team with members who are in grades spanning multiple divisions), the team's division will be based on the oldest student. For example, if two 5th-grade students and one 6th-grade student form a team, the team will be considered in the 6th-8th division. KEP verifies the participating student's grade level via signed photo release forms.

Although there is no team size requirement, a team of 3-5 students is recommended to encourage all members to contribute equally. **Teams advancing to Worlds can have a maximum of 5 students.**

Each team must have a coach/teacher. The coach/teacher is responsible for registering the team(s) for the competition, managing team progress, and supervising the team(s) at events. One person can be a coach for multiple teams, however one adult for every ten students is required at the in-person competition.

Registration Process

Registration is a two-step process and is completed [on the KEP website](#). Choose the regional challenge(s) that make the most sense for your team location and/or schedule. Each regional challenge is typically limited to 16-20 teams depending on location and timing.

Each school can request a maximum of three teams per age division. However, the third team in each age division is automatically added to the waiting list. Even if a school splits up its teams across multiple regional challenges, it cannot exceed three teams per age division. If KEP receives more registrations than it can handle, all new registrations will be put on the waiting list. For schools that have teams on the waiting list, KEP will notify them prior to the event if there is room for their team(s). Wait list priority will be based on the registration date. Schools that have several teams interested in participating should consider hosting an internal KidWind Challenge at the school to decide which teams to bring. KEP staff may be able to provide support if available.

The second step of the registration process occurs a few weeks before the challenge begins when teachers/coaches provide more detailed information about their teams (team and student names, dietary restrictions, etc.) By the day of the event, photo releases must be provided for each team member and any other person who may appear in photos.

Event Logistics and Example Timeline

The KidWind Challenge is a full-day event that runs from approximately 8 am to 4 pm. KEP will provide a finalized schedule to the registered coaches before the event. Throughout the day, each team will visit four event stations – Wind Turbine Performance Testing, Judging Room, Knowledge Quiz, and Instant Challenge. Each station lasts about 10-15 minutes. When students are not at an event station, they can be preparing for the competition and working on their turbines. Typically, there are other optional activities that students can do during their downtime.

The date and location details for each event can be found on the [KidWind Upcoming Events page](#). Snacks and food are provided. As part of the registration process, teachers will notify KEP before the event if students have any dietary restrictions or preferences. Approximately 1-2 weeks after the event, KEP will send coaches/teachers scanned copies of scoring sheets and judges' comments.



Figure 2: 2026 State KidWind Challenge

Example Timeline for a KidWind Challenge Event

- 8:00-9:00 am: Teams arrive, check-in, and practice tunnels are open
- 9:00-9:30 am: Formal welcome and opening presentation
- 9:30-12:00 pm: Event Stations open (Teams rotate through the Judging Room, Knowledge Quiz, Wind Turbine Performance Testing, and Instant Challenge)
- 12:00-1:00 pm: Lunch
- 1:00-3:00 pm: Event Stations continued
- 3:00-4:00 pm: Event Stations close, Sponsor Presentation, & Winner Announcements

Note: Times vary based on location and teams. When teams are not at one of the four event stations, they will have downtime to work on turbines and prepare for the competition. Each station is typically 10-15 minutes long, which includes time for directions and task completion.

Cost to Participate

Participation in the challenge is free, aside from your time and materials! A [Vernier KidWind generator](#) is required (3 for \$25), but KEP can provide one to each team. Thanks to sponsor funding, reimbursements can be made to schools for travel and substitute teacher costs. Coaches are responsible for obtaining and submitting reimbursement forms to KEP.

Photo Releases

Photo releases must be provided for each team member and any other person who may appear in photos. The organizers typically use a nametag sticker to identify people who did not submit a photo release, so all are required to wear the nametags provided.

Food and Snacks

Snacks and lunch will be provided at each event. Please notify KEP before the event if there are any dietary restrictions or preferences. This information will also be requested on the Team Information Form.

Scheduling Conflicts & Inclement Weather

We understand sometimes your schedule may not allow you to attend the entire day. If you have a scheduling conflict, contact the organizers as soon as possible and we will try to accommodate you. We do our best to design the schedule in a way that prevents teams going from one event station directly to another and cannot guarantee every scheduling issue can be resolved. In case of vehicle troubles or other issues on the day of the event, let us know as soon as possible so we can adjust and announce schedule changes at the event. Teams are not allowed to swap time slots unless first approved by the organizers. If the coach cannot attend, substitute adults are allowed.

KEP reserves the right to cancel an event if there are not enough teams.

Inclement weather policy: this is flexible and subject to change. In the case of inclement weather, KEP will be in frequent communication with coaches. Typically, if an event is to be canceled, coaches will be notified the evening before. If hosting the Challenge on the scheduled date isn't possible, KEP will look at holding the event the following day, or postponing/canceling the event.



Basic Rules and Scoring

Many of the rules and scoring methods closely follow the [World KidWind Challenge](#) in order to better prepare students who advance. However, there are some differences. For KidWind Challenges in Kansas, please follow the rules in this guidebook. More details are below under each of the four competition areas/events.

- Each team will receive a score (out of 100 points) based on turbine performance (40), judges panel (40), knowledge quiz (10), and an instant challenge (10). See Figure 3 below.
- The score sheets will be scanned and emailed to the team coach ~1-2 weeks after the competition.
- If there is a tie in points, the tie will be broken based on the highest energy output of the turbines.

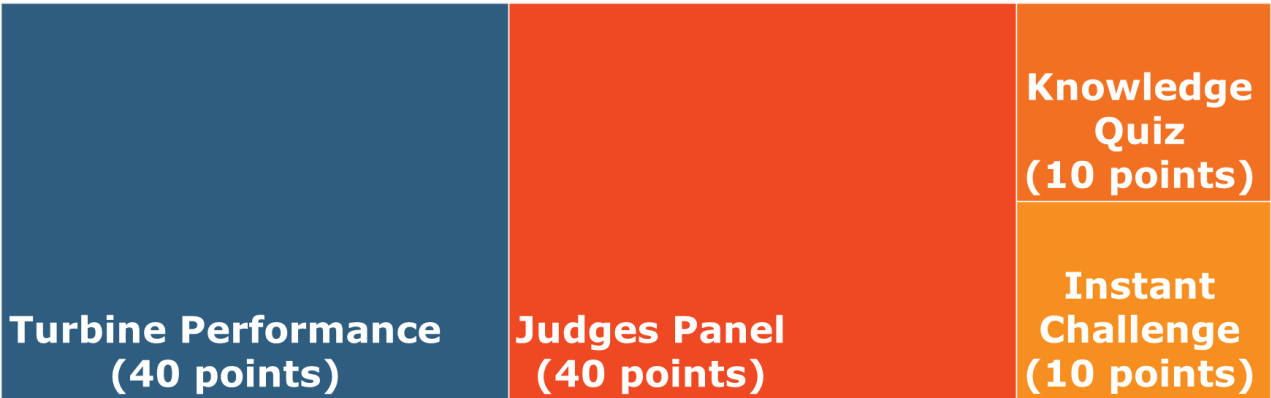


Figure 3: KidWind Scoring Rubric

Use of Artificial Intelligence (AI)

General AI Requirements

- Students must remain the primary authors
- All AI must be disclosed and cited; students must include prompts and AI answers
- AI-generated information must be verified using reliable sources
- If AI is used, it should be used to assist learning and not to replace student thinking

Permitted Uses of AI

- Brainstorm ideas and variables
- Writing support like grammar and spell checks (but avoid using AI to rewrite all text)

Prohibited Uses of AI

- Using AI to create or write your Judges Panel presentation
- Using AI to solve problems – solutions must be the team’s original ideas

Note: AI rules are based on the National Science Teaching Association’s (NSTA) [Competitions AI Use Policy](#)

Turbine Design

General

- A team cannot share any part of its turbine with another team.
- A team can bring more than one turbine, but only the best performance will be included for scoring (*note: this may not be allowed at the World KidWind Challenge*).
- The entire turbine must fit inside a 48"x48" wind tunnel – allow some room! If any part of the turbine will not fit, the turbine must be modified to fit inside the tunnel or be disqualified. No part of the turbine can touch the clear plastic cover.
- Turbine must be free-standing; a tower/stand will not be provided. There will be water weights (similar to sandbags) available at each competition. Be sure your turbine is heavy enough or can be weighed down to prevent it being blown over or sucked into the fans.
- The turbine must be able to start turning and producing power using only wind energy without external assistance (e.g., students cannot give it a push to get it started).
- Turbines can be either a vertical or horizontal axis.
- Unlike a typical fan, the competition wind tunnel pulls wind through the tunnel instead of pushing air onto the turbine. This design creates a more powerful and consistent airflow to streamline testing and should not affect the design requirements for your turbine.
- While teams are allowed to use purchased parts (other than airfoil blades), points may be awarded in the Judging Panel for creativity and economical use of resources.
- The [Vernier Go Direct Energy Sensor](#) is used to measure energy output in Joules (J) and has a built-in 30-ohm resistor, which will be used when testing. Don't forget to test with a 30-ohm load when practicing! Contact the Kansas Energy Program to borrow a sensor; if borrowing one of KEP's wind tunnels, the sensor will be included.
- While limited supplies will be available for repairs, teams should consider accessibility and ease of repair in case something goes wrong. Examples of issues teams have faced:
 - Unable to replace generator due to glue or a gearbox housing that would not open.
 - Unable to replace a broken blade, because the team had glued blades into the hub.
 - Students must be careful when applying lubricant to avoid staining floors or tables.



Figure 4: Students presenting to panel of judges at 2026 State KidWind Challenge

Generator

- Teams MUST use a [KidWind Generator](#) for the regional event (KEP can provide one per team at no cost if needed). This is the only required part.
- **At State, teams will complete a check-in procedure to ensure they are assigned to the correct generator category.**
- Generator options available at State for 6th-8th and 9th-12th grade teams are:
 - KidWind Generator
 - Open Division (*Advanced Generator - commercially sold AC or DC generator*)
 - Homebuilt Division (*ALL major components of the generator are constructed by the students. This means the coils are wound by students and the stators and other components have been constructed, 3D-printed, or otherwise built by the team. This does not extend to magnets or driveshafts and similar components in this device*).
- At the regional Challenges, only one KidWind Generator is allowed per turbine. At the State Challenge, if a team chooses to use more than one KidWind generator with its turbine, it will be placed into the Open Division.
- For teams in the Open or Homebuilt Division at the State Challenge, teams may provide their own load, as long as it is a minimum of 30 Ohms (Ω) and they notify the judge before the test. Only static loads are allowed as wind speed is not variable. Teams may not use Maximum Power Point Tracking (MPPT) devices or variable resistors. The load can be changed between each test, but not during a test.

Blades

- **Blades must have dull edges and ends to prevent puncturing the plastic tunnel sides if they were to fly off the turbine during testing.** Blades should be made of safe materials, such as cardboard, balsa wood, 3D-printed material, etc. Metal, Plexiglass, and similar materials are discouraged. If the organizers deem blades to be unsafe, the turbine must be modified, or it will be disqualified. If a team is uncertain whether its turbine blades will be considered "safe," it can bring a second set of blades using another material to the competition.
- Teams cannot use pre-made airfoils. If students want an airfoil shape, the blades must be designed and made by the team members.
- If a team 3D-prints blades, ensure the students are prepared to explain to judges how they used this process (the judges want to make sure students understand the technology and did the work themselves).

Shrouds

Shrouds are not allowed. See Figure 5 below for examples of what a shroud may look like.

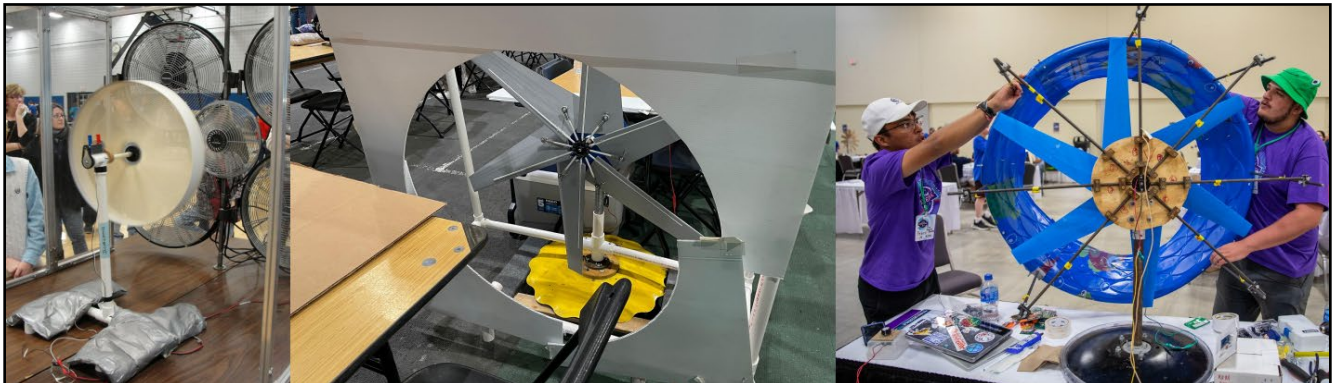


Figure 5: Example images of shrouds from the World KidWind Challenge.

Everything else

- Teams can use KidWind gearboxes and parts, purchase them from other vendors, or create their own.
- The approximate wind speed in the wind tunnel used at the competition is 3.5 meters/second (7.8 mph), so test your device to ensure it can withstand strong winds!
- Teams are not allowed to bring lighters, blow torches, or other devices to the KidWind Challenge that could create a safety concern. If you're not allowed to use a device in your classroom, you likely should not bring it to the competition. Reach out to the organizers if you have questions.

Turbine Performance (40 points)

- Practice tunnels are available for teams to use before official testing begins.
- Turbines will be scored based on the amount of energy they can produce in a 30-second period known as a "run."
- Energy production will be measured using the [Vernier Go Direct Energy Sensor](#) in units of Joules with the 30-Ohm resistor turned on.
- Each team will have two testing sessions (a longer period typically before lunch and a second shorter period in the afternoon).
 - The first testing period will last 10 minutes with six minutes of official testing time. Four minutes will be allowed to set up and remove the turbine.
 - The second testing period will last five minutes with three minutes of official testing time. Two minutes will be allowed to set up and remove the turbine.
- Teams can perform as many 30-second runs as desired during each testing period and adjust their turbine between each run.
- Only the best 30-second run of the day will be used. There is no penalty for a bad run.
- For the run to count for scoring:
 - The turbine must be able to start turning and producing power on its own without external assistance (e.g., students cannot give it a push to get it started).
 - The turbine must complete the full run and produce energy for the entire 30-seconds (it is ok if there are brief starts and stops of less than three (3) seconds each).
- For the first run of the day, KEP recommends teams allow their turbine to run the full 30 seconds (unless the turbine looks like it will experience mechanical failure). This guarantees the team will achieve a successful run in case the turbine fails on a later run.
- After the first successful run, teams can shut off the wind tunnel and end a run early at their own discretion; teams can often tell within a few seconds if a run will be their best and ending a run early can save the students time for adjustments.
- Organizers and judges have the final say on rulings and disputes.
- Only student team members are allowed to adjust the turbine. Parents and coaches are asked to stand back and not assist; they can provide verbal recommendations, but the team will decide whether or not it wants to implement those recommendations. Penalty points may be assigned if coaches fix or handle the turbine or enter the wind tunnel space.



Figure 6: Wind tunnel testing (2026)

How Turbine Performance Scoring Works

- Turbines will be ranked by energy output in Joules (J) – up to 40 points.
- A score of zero points will be awarded if the turbine fails to complete a successful run. Because students will have time to repair/improve their turbines between the two testing periods, no additional performance testing opportunities will be given.
- The greatest energy-producing turbine will receive full points (40) and the remaining teams will receive points based on a rank with a 2.5 to 9-point deduction for each position from the top turbine. The point-spread will depend upon the number of teams in the age division, which is typically a maximum of 8-12 teams. See examples below:
 - 1-4 teams: 9-point spread (1st place: 40 points; 2nd place: 31; 4th place: 13)
 - 5-8 teams: 5-point spread (1st place: 40 points; 2nd place: 35; 8th place: 5)
 - 9-12 teams: 3-point spread (1st place: 40 points; 2nd place: 37; 12th place: 7)
 - 13-16 teams: 2.5-point spread (1st place: 40 points; 2nd place: 37.5; 16th place: 2.5)
- Curious about why we're using this ranking method?
 - KEP initially considered using the ratio method (grading on a curve), but decided it wasn't the best fit for the competition and is continuing with the ranking method. Even KidWind Worlds isn't certain which method is best (it really depends on how all the turbines perform).
 - Ratio method example: If the top turbine produced 100 J, that team would score 40 points. If the second-best turbine produced 50 J (or 50% of the top turbine), that team would then score 20 points. The other teams would score even less than this.
 - The ranking method requires teams to score well across all four areas of the competition, rather than just doing great in the wind turbine performance area. The more teams there are, the less point spread there will be. This method ensures the lowest-placed team will still earn points.

Judges Panel (40 points)

- Spectators, teachers, and parents are not allowed in the room – only students, judges, and a timekeeper.
- A panel of 3-5 judges will meet with each team for up to 10 minutes.
- The first portion of the judges panel (3-4 minutes) will consist of students presenting the results of their turbine design-and-build process.
 - Teams should bring their turbine and some type of documentation that reflects their engineering design process. This can be a short report, PowerPoint, notebooks, poster boards, or anything that effectively communicates the design process and the team's experience. Documentation is always recommended as it assists the team in tracking ideas and progress. **The presentation should not be about wind energy in general.**
 - If students need Wi-Fi or equipment for the presentation (e.g., a laptop, projector, etc.), KEP will do its best to accommodate, but please be prepared with a backup plan in case technology doesn't work as planned. We encourage teams to download their presentation before the event. We will likely ask students to send us their presentation ahead of time (Google Drive is best).



Figure 7: Judges Panel (2026)

- The second portion (4-5 minutes) is for judges to ask questions.
 - This interview is intended for judges to gain a better understanding of the team's process to design, build, and test its turbine.
 - Each team should be prepared to discuss and explain the choices incorporated into their design.
- Judges will all meet before the competition to discuss scoring criteria and to ensure they are on the same page. KEP plans to have all students in the same age division scored by the same judges. When needed, teams may be called back by judges during a break.
- The score for the judging portion of the competition is an average of the judges' scores.

Knowledge Quiz (10 points)

- Teams will typically be given 10 minutes to complete the quiz. Instructions and required materials will be provided to the team before the quiz. Students are not allowed to use phones or other electronic devices.
- Students will collaborate to answer questions on the quiz. The knowledge quiz has 10 questions including multiple choice, true/false, & fill in the blank.
- If any student(s) on the team require the questions to be read aloud or need other accommodations, please inform the event organizers.
- The study guide used to develop the quiz questions is available online at <https://kansasenergyprogram.org/educators/kidwind-challenge/kidwind-challenge-resources>.



Figure 8: Knowledge Quiz (2025)

Instant Challenge (10 points)

- The instant challenge is an event that remains unannounced until the day of the event, so no preparation is necessary.
- Teams will be given a set amount of time to complete the challenge (it may be longer than the 10-minute sessions used for other parts of the Challenge). Instructions and required materials will be provided to the team. Students are not allowed to use phones or other electronic devices.
- After completing the Instant Challenge, KEP requests that teams avoid discussing anything about the event within hearing distance of teams that have not yet completed the task.
- Please remind students that KEP may assign penalty points if students use a phone during an instant challenge or knowledge quiz event.



Figure 9: Instant Challenge (2026)

Penalties

- Teams will earn a deduction on their overall score for any of the following actions:
 - Using a phone or electronic device during the instant challenge or knowledge quiz.
 - Students being disrespectful of the facility or KEP equipment.
 - Coaches/adults repairing or making improvements to the turbine during the KidWind Challenge event without prior approval from an event organizer. If adult assistance is required, please consult an organizer beforehand.
 - Coaches/adults trying to enter judging area.
- In most cases, an initial warning will be given to the team, and upon the second observation, the deduction will be reported to the scorekeeper.
- The first penalty awarded will be 1 point. Additional penalties will be 3 points each.

Rules for Coaches and Adults:

- Coaches and adults are expected to create and maintain a positive learning environment.
- You are not allowed to make any changes or repairs to the turbine while at the competition without prior approval from an event organizer. ONLY students are allowed to modify their turbine. Penalty points may be assigned to the team if this occurs (see section above).
- During performance testing, please make only **constructive recommendations**. If you try to direct students by telling them what to do, the organizer may request you to stop interacting with the team during performance testing.
- Please make sure your students are on time and ready to go at each event station (especially during wind turbine performance testing in the afternoon).

Other Useful Information

Safety and Supplies

To ensure safety precautions are taken, students must be supervised by one of the adults responsible for their team when using any tools. **Teams are not allowed to bring lighters, blow torches, or other devices to the KidWind Challenge that could create a safety concern.**

If teams bring their own tools or supplies, be sure they are clearly marked with the school or team name. If KEP cannot identify the owner of the item, it will become part of the future repair kit.

There will be limited supplies and tools available for repair at each challenge, so please consider bringing anything deemed necessary for repairing the team's wind turbine. There will also be a limited number of spare generators.



Figure 10: Turbine Repair (2025)

Facility Use

KEP is very fortunate to have great location sponsors allowing the use of their space, tables, and other furniture. Make sure to limit the amount of mess teams create and encourage students to pick up after themselves.

Be careful with lubrication such as WD-40 and graphite, which may end up on the floor/carpet when the turbine spins. There will be canvas put down underneath the wind tunnels.

Avoid directly gluing or cutting on any surface. A cutting mat will be provided by the organizers. Please only use adhesives on top of paper or cardboard.

Resources & Equipment:

Resources to help prepare for the KidWind Challenge can be found on the [Resources webpage](#). KEP loans out equipment to assist with preparing for the KidWind Challenge, including wind tunnels! Equipment can be checked out at the [KEP Equipment Library](#). Filter equipment with “wind energy” as the focus area to find all the wind-energy-related equipment.



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KIDWIND CHALLENGE RESOURCES from the Kansas Corporation Commission and K-State Engineering Extension. Made possible by a grant from the U.S. Department of Energy. Document last revised 10/21/26. *Page 12 of 12.*

