DEQ's AIR-FAIR Rules & Guidelines

A Statewide Idaho High School Air Quality Competition



DEQ St, Maries Regulatory Monitor. Photo Taken By: Emily Flores

Program Highlights:

- Open to Idaho high school teams (4–8 students)
- Investigate local air quality using real-world $PM_{2.5}$ data
- Optional use of DEQ-provided PurpleAir sensors (up to 2 per school)
- Complete fun "air-tivities" including research, art, videos, outreach and more by April 1, 2027
- Awards for top projects and recognition as DEQ "Air Ambassadors"

Deadline for teams to apply is October 1, 2026!

DEQ's AIR-FAIR 2026–2027 Pilot Program Guide

The Idaho Department of Environmental Quality (DEQ) is excited to launch the 2026–2027 "AIR-FAIR," a statewide pilot program that encourages Idaho high school students to become citizen scientists by exploring air quality in their communities. Using existing air quality data, data collected using DEQ-provided PurpleAir sensors, or a combination of both, students will analyze and interpret real-world environmental information. The AIR-FAIR program focuses on fine particulate matter ($PM_{2.5}$), which consists of tiny airborne particles that can affect human health and the environment.

The program will run from January 1 through April 15, 2027, with winners announced on May 1, 2027.

Participating teams may request up to two PurpleAir sensors per school, depending on their project needs. The sensors can only be installed outdoors on school campuses where an electrical outlet and Wi-Fi are available. Teams do not need a PurpleAir sensor to participate and may complete their projects using existing DEQ or EPA air quality data.

Working in teams of 4–8 students, participants will investigate environmental questions, explore local air quality events, create scientific and artistic projects, and develop outreach materials to educate others about air quality and environmental stewardship. Teams can choose from a variety of topics, and students are encouraged to pursue ideas that match their interests. Teams earn points by using air quality data to complete optional "air-tivities" such as:

- Research Question Analysis
- Research Question Poster
- Art Project
- Infographic
- Two-Page Paper
- Video
- Social Media Campaign
- AQI Awareness Campaign
- Policy Pitch or Community Action Plan

Team Eligibility:

Must include 4-8 students currently enrolled in a recognized public, tribal, private, or charter high school with one adult affiliated with the school.

Projects will be evaluated using an effort-based rubric that recognizes creativity, critical thinking, effective use of air quality data, scientific reasoning, and student engagement. Awards will be presented in several categories, including Best Research Project; Best Art Project; and 1st, 2nd, and 3rd Place for the highest scoring teams. The five winning teams will serve as DEQ's "Air Ambassadors" of the year.

Participation is open to eligible high school teams throughout Idaho. Applications and PurpleAir sensor requests will be evaluated based on project needs, geographic representation, and available resources. Teams may still participate using existing air quality data if DEQ is unable to fulfill their sensor request. The deadline for a team to apply for the AIR-FAIR pilot program is **10/1/2026.** An application form must be submitted for each team competing within a school. Each team should share the same adult advisor who acts as the main point of contact for DEQ staff and is responsible for the PurpleAir sensor if requested.

AIR-FAIR Timeline

August 15 - September 31	**Outreach and School Recruitment** DEQ promotes AIR-FAIR statewide and recruits interested schools.
October 1	**Team Registration Deadline** Schools submit participating teams and advisor information to DEQ.
November 1	**School Selection & Purple Air Distribution** Selected schools are notified and receive PurpleAir sensors and program materials.
December 1	**PurpleAir Installation Deadline** PurpleAir sensors should be installed and operational.
January 1 - April 15	**Air-tivity Competition** Teams collect data, complete air-tivities, and submit projects.
April 15	**Submission Deadline** All air-tivity submissions must be received by DEQ.
May 1	**Winners Announced** DEQ announces overall winners and special award recipients
May 31	**PurpleAir Return Deadline** PurpleAir sensors are returned to DEQ unless arrangements have been made for continued participation.

Team Application Eligibility Requirements

The AIR-FAIR is open to high school students attending an Idaho public, private, Tribal, or charter school. Each team must have an adult advisor who is a staff member at the participating school and will serve as the team's main point of contact with DEQ. A school may have multiple teams competing against one another as long as they share the same adult advisor who assumes responsibility of any PurpleAir sensors that were requested. Completing a research question air-tivity is optional and is not required to participate in the AIR-FAIR. Requesting a PurpleAir sensor is optional and is not required to participate in the AIR-FAIR.

AIR-FAIR Project Standards & Expectations

Team Expectations

- Consist of 4–8 high school students per team.
- Have one designated adult advisor (teacher, coach, or school staff member) who will serve as the primary point of contact with DEQ.
- Use existing air quality data from a reliable resource, data collected using a DEQ-provided PurpleAir sensor, or a combination of both to complete air-tivities.
- Fill out DEQ's survey at the end of the project that describes your participation experience.

Student Expectations

- Produce original work while working together as a team.
- Properly cite outside information, data sources, and images when appropriate.
- Use $PM_{2.5}$ and other relevant air quality data accurately.
- Follow the air-tivity rubric and submission guidelines.
- Use DEQ provided resources and links as needed.

Advisor Expectations

- Must be an employee of the institution that your team is representing.
- Serve as the primary contact between the student team and DEQ.
- If the team receives a PurpleAir sensor, oversee its safe and responsible use.
- Manage the set up and take down of the PurpleAir sensor.
- Return the PurpleAir sensor to DEQ after project completion, following DEQ's instructions.
- Schools interested in participating in AIR-FAIR the following year may contact DEQ to request permission to keep the sensors over the summer.
- Promote student ownership of projects while providing guidance as needed.

PurpleAir Sensor Expectations

The following expectations apply **only to the schools that requested a PurpleAir sensor from DEQ:**

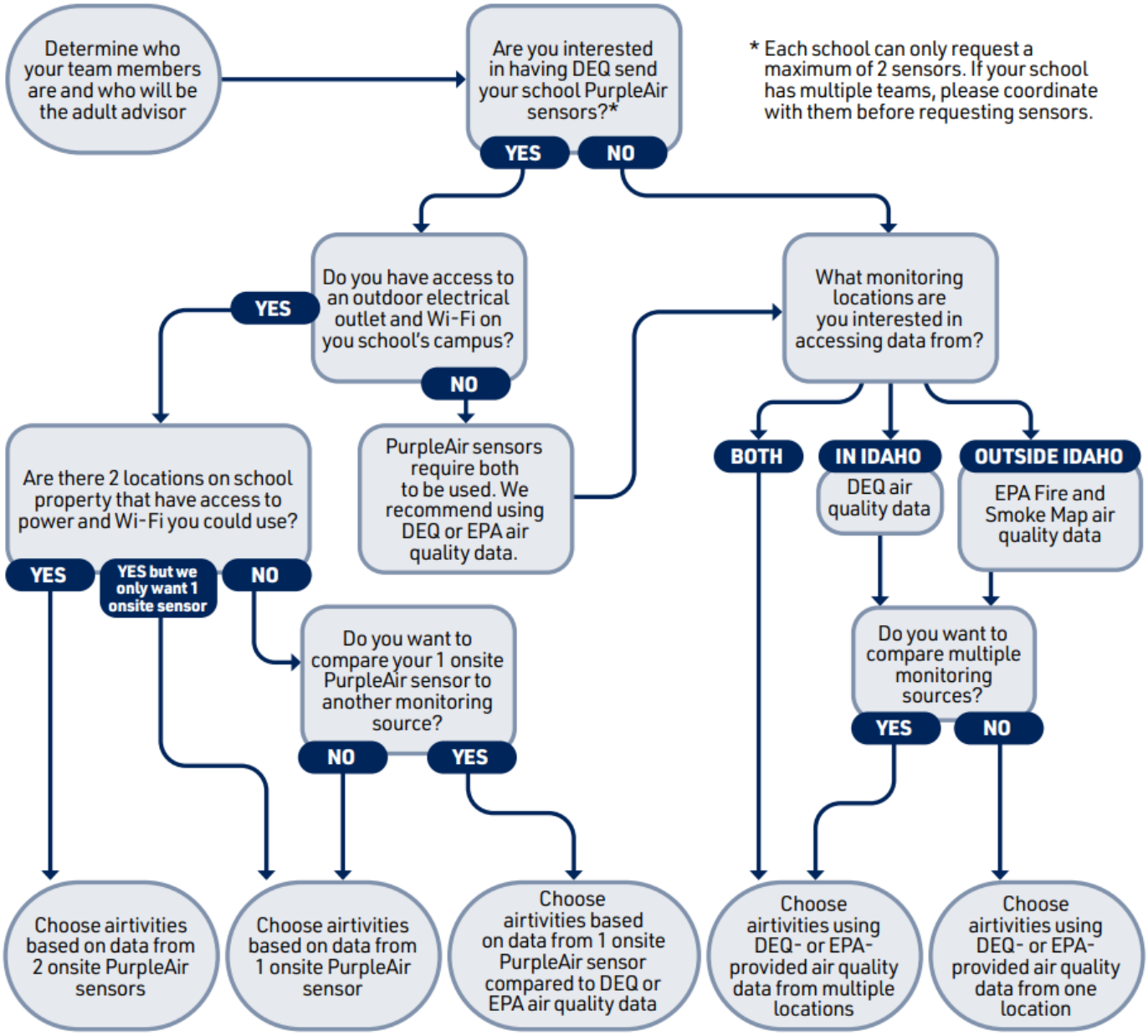
- PurpleAir sensors must remain private on the Fire and Smoke Map.
- Sensors must be installed according to PurpleAir and DEQ guidance on the school property described in the application form.
- Do not modify or relocate the sensor without notifying DEQ.
- Contact DEQ immediately if the sensor is damaged or stops working.
- Return the sensor at the end of the program unless otherwise approved by DEQ for the following year.

AI Use and Expectations

- AI sources must be cited if used for any part of the air-tivities.
- AI cannot be used to create art, graphics, or social media posts.
- For projects containing graphics – drafts must be provided in your submittal to show your work.

Team Application Decision Tree

What you need to know when filling out the AIR-FAIR application form for your team:



Air-tivity Submission Guidelines and Scoring

Each air-tivity is assigned a maximum point value. Every submission requirement is assigned a point value based on its importance to the project. Teams receive points for each completed requirement, allowing judges to score consistently and objectively, based upon effort and completeness. Teams are encouraged to complete as many air-tivities as they wish to earn additional points throughout the competition. Each team may submit only one project per air-tivity type, allowing a maximum of nine submissions per team. The submission form for air-tivities can be accessed at any time on the DEQ AIR-FAIR website.

- Unless otherwise noted, all written materials should be submitted as a PDF.
- Written documents should use 12-point Calibri font, single-spaced.
- All projects must include scientifically accurate information.
- PurpleAir data should be incorporated whenever applicable.
- All graphics, images, charts and figured should be clear, readable, and appropriately labeled.
- Students are encouraged to cite all outside sources used in their project in the team's submittal form.
- Projects must be the student's original work.
- Projects must be submitted through the submittal form linked on the website by the due date: 4/15/2027.

***** If AI tools are used during project development, students must acknowledge how they were used. AI should support learning and creativity but should not replace the student's original work. AI-generated artwork will not be accepted.*****

Air-tivity Rubric & Submission Requirements

Max Points	Air-tivity	Description	Submission Requirements
500	**Research Question Analysis**	Develop a research question and complete a written report documenting your scientific investigation and conclusions. Students will develop and investigate an approved research question related to $PM_{2.5}$ air quality using existing air quality data, data collected with a PurpleAir sensor, or a combination of both. Students will apply the scientific method to analyze their selected topic. Examples of research questions can be found on the AIR-FAIR website. Students are encouraged to use this as the "first step" to developing the Research Question Poster (air-tivity below).	**Two to Five-Page PDF Including:** 100 pts) Clearly stated and approved research question 100 pts) Background information on why research question was chosen 100 pts) Scientific method followed 100 pts) Air quality data included and analyzed 100 pts) Written conclusion that answers the hypothesis
350	**Research Question Poster**	Create a poster that presents your research question, scientific investigation, $PM_{2.5}$ air quality data, and conclusions. Students should organize their information in a clear, visually engaging format that effectively communicates their research process and findings. This air-tivity allows students to share their scientific investigation with others while practicing science communication skills. Information from their research question analysis (air-tivity above) is allowed to be reused and highlighted in the poster presentation.	**One-Page Large Poster PDF Including:** 25 pts) Clearly stated and approved research question 25 pts) Background information on why research question was chosen 25 pts) Scientific method followed 25 pts) Air quality data included and analyzed 50 pts) Written conclusion that answers the hypothesis 200 pts) Organized, easy to read and follow, poster design following the given template located in the “AIR-FAIR Resources and Links” document.
500	**Art Project**	Create an original piece of artwork inspired by $PM_{2.5}$ or other air quality data, weather, or another approved air quality topic. Artwork may include paintings, drawings, sculptures, photography, digital art, mixed media, or another approved artistic medium. Students should use their artwork to communicate an air quality message and explain how it relates to air quality data or what they learned throughout the project. Students should also emphasize why they think their chosen air quality topic is important to educate the public about. We will not accept AI produced artwork.	**Original Piece of Artwork:** 200 pts) Physical submission to regional office OR high-quality images of the project **Two-Page PDF:** 100 pts) Explains the art and how it relates to air quality data or findings 100 pts) Explains the intended audience and what your art is trying to convey to them 100 pts) Explains why you are choosing art to educate people on your chosen air quality topic(s) and why you think it is important
400	**Infographic Report**	Create an infographic that visually communicates an air quality topic and highlights findings from air quality data. Students should use graphs, charts, maps, illustrations, icons, or other visuals to present scientifically accurate information in a clear, engaging, and easy-to-understand format. The goal of this air-tivity is to communicate complex air quality information in an informative and visually appealing manner. We will not accept AI produced infographics.	**Two-Page PDF Including Multiple Infographics:** 100 pts) At least 2+ graphs, charts, maps, and/or other professional visual representations of data 100 pts) Explanation of your findings 50 pts) A clear title and figure captions for each infographic 50 pts) Includes accurate air quality data 50 pts) Scientifically accurate information 50 pts) Organized, visually appealing layout that is easy to read

Max Points	Air-tivity	Description	Submission Requirements
400	**Two-Page Analysis**	Write a two-page paper that compares one source of $PM_{2.5}$ air quality data with another approved data source. This comparison may include local weather observations (https://www.weather.gov/), data from DEQ regulatory monitors (https://airquality.deq.idaho.gov/home/map**),** another PurpleAir sensor in Idaho (https://fire.airnow.gov/#4.11/41.92/-97.14**),** or another approved air quality dataset from Idaho or other states across the country. Students should analyze similarities and differences between the data sources, explain possible reasons for those differences, and use evidence to support their conclusions.	**Two-Page PDF Including:** 100 pts) Comparison of PM2.5 air quality data to another approved air quality data source 100 pts) Supporting graphs, tables, and/or figures highlighting the data findings 100 pts) Explanation and theories of the observed differences and/or similarities 100 pts) Conclusion of findings
300	**Video**	Create a video (3-10 minutes) that educates viewers about an air quality topic using $PM_{2.5}$ air quality data. Students may explain a research question, investigate an air quality event, discuss the Air Quality Index (AQI), or compare data sources. Videos should be scientifically accurate, engaging, and designed for the intended audience.	**Video (or YouTube link) Including:** 100 pts) 3-10 minutes in length 50 pts) Includes air quality data 50 pts) Scientifically accurate information **One-Page PDF:** 50 pts) Explains how the video relates to air quality data 50 pts) Explains why you are educating people on your air quality topic(s)
300	**Social Media Campaign**	Create four or more social media posts that highlight $PM_{2.5}$ air quality data used or analyzed by your group. Students may promote a research question they investigated or educate the public about another approved air quality topic. This air-tivity encourages students to communicate scientific information in a creative, engaging format while considering how to effectively reach their intended audience. We will not accept AI produced graphics.	**Four Original Social Media Graphics/Posts Including:** 100 pts) Four original and engaging graphics that were drawn digitally or by hand 50 pts) Captions for each of the four posts 50 pts) Scientifically accurate information **One-Page PDF:** 50 pts) Explains how the social media campaign relates to air quality data 50 pts) Explains why you are educating people on your chosen air quality topic(s)
300	**AQI Awareness Campaign**	Create an awareness campaign that educates others about the Air Quality Index (AQI) and how it can be used to make informed decisions about outdoor activities and health. Students may develop educational materials, presentations, flyers, displays, or other outreach products designed for a specific audience. This air-tivity encourages students to communicate the importance of air quality with a focus on the AQI for $PM_{2.5}$, use relevant air quality data, and promote reliable AQI resources. We will not accept AI produced graphics for the AQI campaign. For more information on the AQI, go to https://www.airnow.gov/aqi/aqi-basics/	**Awareness Campaign Including:** 100 pts) At least one original educational product (presentation, flyer, poster, display, brochure, etc.) 50 pts) Scientifically accurate AQI information and descriptions 50 pts) Connection to air quality data **One-Page PDF:** 50 pts) Explains the intended audience and the goal of the campaign 50 pts) Explains how the campaign promotes AQI awareness and relates to air quality data
300	**Policy Pitch/ Community Action Proposal**	Develop a proposal that uses $PM_{2.5}$ air quality data and research to recommend an action that could improve air quality awareness, preparedness, or public health in your school or community. Proposals may focus on topics such as wildfire smoke preparedness, no-idling campaigns, indoor air quality, educational outreach, or another approved air quality initiative. Students should support their recommendations using scientific evidence and explain how their proposal could positively impact on their community.	**Two to Three-Page PDF Including:** 50 pts) Description of the identified air quality issue 50 pts) Explains the intended audience and the goal of this pitch/proposal 50 pts) Proposed solution or recommendation 50 pts) Supporting air quality data or scientific evidence 50 pts) Expected community benefits 50 pts) Conclusion summarizing the proposal

Air-tivity Research Question Analysis

When applying for AIR-FAIR and selecting your team's research question, consider what air quality data you will use and whether your project requires any on-site PurpleAir sensors. Each participating school may receive a maximum of two PurpleAir sensors. The data provided by the requested on-site PurpleAir sensors must be shared amongst teams at the same school.

If your team plans to use data from a single on-site PurpleAir sensor and compare it to data from another source (such as a PurpleAir sensor at another location, or a DEQ regulatory air quality monitor), identify the comparison monitor(s) in your team's application form.

If your team has an idea for a new research question not provided in the list below, contact DEQ staff with your question and the reasoning for researching the topic. Your team may also change its research question after submitting the application form. Contact DEQ staff to approve the research question change. DEQ-provided sensors must be installed in an approved location on school grounds with power and Wi-Fi.



DEQ Porthill Regulatory Monitor. Photo Taken By: Russel Tipping

List of Potential Air Quality Research Questions

School Transportation

- How do school pick up lines affect $PM_{2.5}$ concentrations?
- How does nearby traffic affect $PM_{2.5}$ concentrations?
- How does car idling affect $PM_{2.5}$ concentrations?
- How does the number of buses during drop off and pick up affect $PM_{2.5}$ concentrations?
- Does the morning school drop off have a larger impact on $PM_{2.5}$ than the afternoon pick up?
- How does school attendance impact $PM_{2.5}$ concentrations?

Weather & Natural Events

- What is the relationship between temperature inversions and $PM_{2.5}$ concentrations?
- How does weather (inversions, wind, dust storms, rain, thunder) affect $PM_{2.5}$ concentrations?
- How do seasonal changes, like pollen, affect $PM_{2.5}$ concentrations?
- Is there a relationship between temperature and $PM_{2.5}$ concentrations?
- Which weather variable (temperature, wind speed, humidity, or precipitation) has the strongest influence on $PM_{2.5}$ concentrations?

Monitoring Comparisons

- How effective are low-cost air quality sensors (PurpleAir sensors) compared to high-cost monitoring stations in monitoring $PM_{2.5}$ concentrations?
- How do PurpleAir sensors compare with DEQ regulatory monitors over a week and when do the greatest differences occur?
- How consistent are $PM_{2.5}$ readings from two PurpleAir sensors placed side-by-side?
- How much does sensor location (height above ground) affect $PM_{2.5}$ measurements?
- How do $PM_{2.5}$ concentrations differ between urban and rural areas?
- How does air quality at our school compare to another school in Idaho?
- How does air quality in Idaho compare to another state?

Time of Day

- At what time of day are $PM_{2.5}$ concentrations highest?
- How does air quality change throughout the day?
- How do weekday $PM_{2.5}$ concentrations compare to weekend concentrations?
- How does nighttime air quality compare to daytime air quality?

Human Activities

- How do lawn mowing and landscaping activities affect $PM_{2.5}$ concentrations?
- How do construction activities affect nearby $PM_{2.5}$ concentrations? (Can only be done if your school has active construction occurring.)
- How do outdoor sporting events affect $PM_{2.5}$ concentrations?

DEQ Contact Information

Contact the AIR-FAIR email if your team needs help with the application process, selecting or completing an air-tivity, downloading or interpreting air quality data, using your PurpleAir sensor, or anything related to the program. DEQ welcomes your questions and feedback to make the AIR-FAIR program successful this year and improve the experience for future competitions.

Official AIR-FAIR Email Address:

Air-Fair@deq.idaho.gov - Please address all questions and comments to this email.

Use the QR code below to access DEQ's AIR-FAIR website:

The AIR-FAIR website includes:

- Link to the team application form (deadline to apply is 10/1/2026)
- Link to the air-tivity submittal form (deadline for all air-tivity submissions is 4/15/2027)
- Air-tivity rubric and submission guidelines
- List of research questions
- Frequently asked questions
- PurpleAir sensor set-up instructions
- List of air-tivity resources and helpful links