

## News release



Everett Public Schools

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### **H.M. Jackson High science students shine in multiple science competitions** *School's new research club's deep research work earns high awards*

Early in March H.M. Jackson High School (JHS) students joined students from four other high schools at the [Washington Junior Science and Humanities Symposium](#) (WJSHS). This two-day event was for high schools whose students have conducted original research in Science, Technology, Engineering, and Mathematics (STEM), with a forum to present their work to a panel of judges and an audience of high school students, teachers, parents, university faculty and students, and professional scientists.

H.M. Jackson students earned five of the top 15 poster presenters on the following topics:

- Phytoremediation of Arsenic in Coal Dust Using *Polystichum munitum*
- Engineering a Device for Utilizing the Kinetic Energy from the Pitching and Heaving Motion of Oceanic Waves through Mechanical Strain Applied to Piezoelectric Elements
- The Effect on Methane Production During the Anaerobic Digestion of Cow Manure Along with Biodegradable Plastic
- Effect of Black Water Waste on the Wattage Output of Photosynthetic Microbial Fuel Cells Powered Off by the Growth of *Anabaena*
- Developing a Cost-Effective Way to Measure the Concussive Force of Head Impacts in High School Athletes and to Alert Their Coaches

Also, a JHS student orally presented at the symposium – one of only 16 chosen to do so – on a research project entitled Development of a Regression Algorithm to Optimize Energy Utilization from the Solar PV Generation System.

JHS students also competed in early March in the [Central Sound Regional Science and Engineering Fair](#) (CSRSEF). This is an annual science and engineering competition for ninth- through 12th-grade students in King and Snohomish Counties in Washington state. CSRSEF encourages and rewards innovative student research and provides professional scientists and engineers the chance to interact with some of the best and brightest young students in the greater Seattle/Everett region.

This year over 20 high schools participated. The three types of awards are: Grand Awards, Category Awards, and Special Awards.

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This year three JHS students earned special awards from the [American Chemical Society](#) (ACS), a congressionally chartered independent membership organization which represents professionals at all degree levels and in all fields of chemistry and sciences that involve chemistry.

Winning awards again at this competition were the following research projects:

- *Phytoremediation of Arsenic in Coal Dust Using Polystichum munitum*
- *The Effect on Methane Production During the Anaerobic Digestion of Cow Manure Along with Biodegradable Plastic*
- *Effect of Black Water Waste on the Wattage Output of Photosynthetic Microbial Fuel Cells Powered Off by the Growth of Anabaena*

The [American Psychological Association](#) awarded a first place award to a JHS student for a project that represents outstanding research in psychology in the Behavioral and Social Science Category.

- *The Effects of 1/f<sup>α</sup> Noise on the Cognitive Ability of High School Students in an Educational Setting*

[ASM Material Society](#) (ASM) is dedicated to serving the materials science and engineering profession. ASM provides authoritative information and knowledge on materials and processes, from the structural to the nanoscale and awarded one JHS student honors for research titled:

- *Engineering a Device for Utilizing the Kinetic Energy from the Pitching and Heaving Motion of Oceanic Waves through Mechanical Strain Applied to Piezoelectric Elements*

The [Association for Women Geoscientists](#) gave two awards to JHS female students – each of whom had earned awards earlier from the WJSH.

- *Phytoremediation of Arsenic in Coal Dust Using Polystichum munitum*
- *The Effect on Methane Production During the Anaerobic Digestion of Cow Manure Along with Bio-degradable Plastic*

Genius Olympiad; Exceptional Genius Awards went to two JHS students who had also placed well at the WJSHS. The [GENIUS Olympiad](#) is an international high school project competition about environmental issues. It is co-organized by the State University of New York at Oswego and the Terra Science and Education Foundation. The two Genius awards went to students whose research topics were:

- *Engineering a Device for Utilizing the Kinetic Energy from the Pitching and Heaving Motion of Oceanic Waves through Mechanical Strain Applied to Piezoelectric Elements*
- *Phytoremediation of Arsenic in Coal Dust Using Polystichum munitum*

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Two students earned Inspiring Excellence Awards. These go to individuals who demonstrated excellence at the competition – as displayed by interest, desire, enthusiasm, perseverance, diligence, scholarship, and positive attitude. The two research topics earning Excellence Awards were:

- *Effect of Black Water Waste on the Wattage Output of Photosynthetic Microbial Fuel Cells Powered Off by the Growth of Anabaena*
- *Producing the Social Facilitation/Social Loafing Effect through Proximal Contact with Friends vs. Strangers*

The National Society of Professional Engineers gives an award to the most innovative engineering project that demonstrates principles of applied engineering and that demonstrates technical competence, superior verbal and written presentation, and awareness of ethical implications of engineering.

- The first place award in this category went to a student whose research was titled *Developing a Cost-Effective Way to Measure the Concussive Force of Head Impacts in High School Athletes and to Alert Their Coaches*

Stockholm Junior Water Prize goes to the best projects relating to or dealing with water treatment, management, protection or quality. They now have the opportunity to advance to the National Water Environment Federation Competition. This year's JHS winner researched:

- *Effect of Black Water Waste on the Wattage Output of Photosynthetic Microbial Fuel Cells Powered Off by the Growth of Anabaena*

Four JHS students earned the U.S. Air Force Certificate of Achievement for Science and Technology on their research of:

- *Utilizing Snake Epidermis for Abrasion Resistance in Knee Surgeries*
- *Exposure to Flame Retardants through Dermal Contact with their Clothing in Addition to a Health Risk Assessment using *Daphnia pulex**
- *Developing a Cost-Effective Way to Measure the Concussive Force of Head Impacts in High School Athletes and to Alert Their Coaches*
- *Minimizing Size and Weight in Standard Military Rations (MRE) for Increased Optimization for Field Use*

Two Army Certificates of Achievement went for the research topics of:

- *Size and Weight in Standard Military Rations (MRE) for Increased Optimization for Field Use*
- *Correlating Leadership and Stress to the Prevalence of Gastro-Esophageal Reflux Disease*

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An Office of Naval Research-Naval Science Award went to a project about:

- *Minimizing Size and Weight in Standard Military Rations (MRE) for Increased Optimization for Field Use*

Category awards earned:

- Biochemistry and Microbiology: *Dangerous Overdoses of Nitrates in the Diets of Europe and North America; Causing Methemoglobinemia in Infants*
- Electrical and Mechanical Engineering: *Engineering a Device for Utilizing the Kinetic Energy from the Pitching and Heaving Motion of Oceanic Waves through Mechanical Strain Applied to Piezoelectric Elements*
- Energy and Transportation: *Effect of Black Water Waste on the Wattage Output of Photosynthetic Microbial Fuel Cells Powered Off by the Growth of Anabaena*
- Environmental Science and Environmental Management: *Phytoremediation of Arsenic in Coal Dust Using Polystichum Munitum and The Effect on Methane Production During the Anaerobic Digestion of Cow Manure Along with Biodegradable Plastic*
- Materials Science and Bioengineering: *Minimizing Size and Weight in Standard Military Rations (MRE) for Increased Optimization for Field Use and Utilizing Snake Epidermis for Abrasion Resistance in Knee Surgeries*
- Medicine and Health Science: *Correlating Leadership and Stress to the Prevalence of Gastro-Esophageal Reflux Disease*

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