

# Galvin's Programmable, Humanoid Robot to Provide Project-based Learning Experiences across Disciplines

NAO (pronounced *Now*) is an autonomous, programmable humanoid robot that is being used in middle schools around the world. And now, the Galvin Middle School has this cutting-edge robot, thanks in part to a \$3000 grant the Wakefield Educational Foundation (WEF) recently awarded Galvin Middle School's Digital Learning Specialist, Katy Williams.



Principal Adam Colantuoni, 5th graders, NAO Robot (no name yet) and Katy Williams.

NAO will support the school's initiative of bringing more cross-disciplinary computer science activities into classrooms and promote computer science by providing self-motivating opportunities for STEAM (science, technology, engineering, arts, math) learning. Two 2D cameras allow NAO to recognize objects; and NAO's facial feature recognition allows it to tailor its interactions to a particular person. NAO speaks 21 languages, can read and respond to student writing, and is able to turn in the direction of a speaker. With 26 degrees of motion and seven touch sensors, students can program NAO to walk in a circle, perform a choreographed dance, find its way out of a maze, and much more.

At the Galvin, teachers will use NAO as an instructional tool to provide authentic project-based learning experiences across disciplines: ELA students will program NAO to read interactive science fiction stories they have authored, or to act out roles in short plays; math students will learn abstract math concepts as they program NAO in the software's flowchart language and then experience the thrill of seeing the robot execute their code. Across all subjects, NAO can be programmed to interact with students by asking questions and responding to student answers. Perceived as 'friendly' and with 'no judgment,' NAO should encourage more students to contribute to class discussions.

The NAO robot will support the school as both a teaching tool and as a robotics programming platform. Staff will program NAO to interact with students throughout the school day in ways that support not just academic learning, but social-emotional growth, iCARE values, and the 21st Century skills of communication,

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collaboration, creativity, and critical thinking. These interactions with NAO will serve as a STEAM entry point for many students, enabling growth in confidence and skills within STEAM fields such as mechanical engineering, computer engineering, computer science, human-computer interaction, and robotics.

In addition, NAO is often used as a research robot in the field of human-computer interaction; and this growing research continues to show that the biggest benefit of NAO is how children relate to and empathize with the robot. NAO supports Galvin's core value focus this year: community and inclusion, with research showing that children on the autism spectrum have high levels of engagement with NAO, as the robot's predictable behavior is less overwhelming than human behavior.



Ms. Williams submitted a grant application through WEF's annual grant process. WEF continually encourages staff and PTO leaders to submit innovative enrichment projects for consideration.

To support the grant process, WEF conducts a series of fundraisers annually, such as: WEF's Wakefield Public Schools Calendar, showcasing student art; the S.T.A.R.S. program, recognizing exemplary WPS staff; Chocolate Roses; and the Adult Spelling Bee. In addition, WEF welcomes individual, business and community donations. WEF is awarding staff and PTO leaders just over \$30,000 for the 2018-2019 school-year and has awarded over \$350,000 to schools across the Wakefield Public Schools district since 1989. Learn more by following WEF on Twitter or Facebook, or go to [www.WEF01880.org](http://www.WEF01880.org).