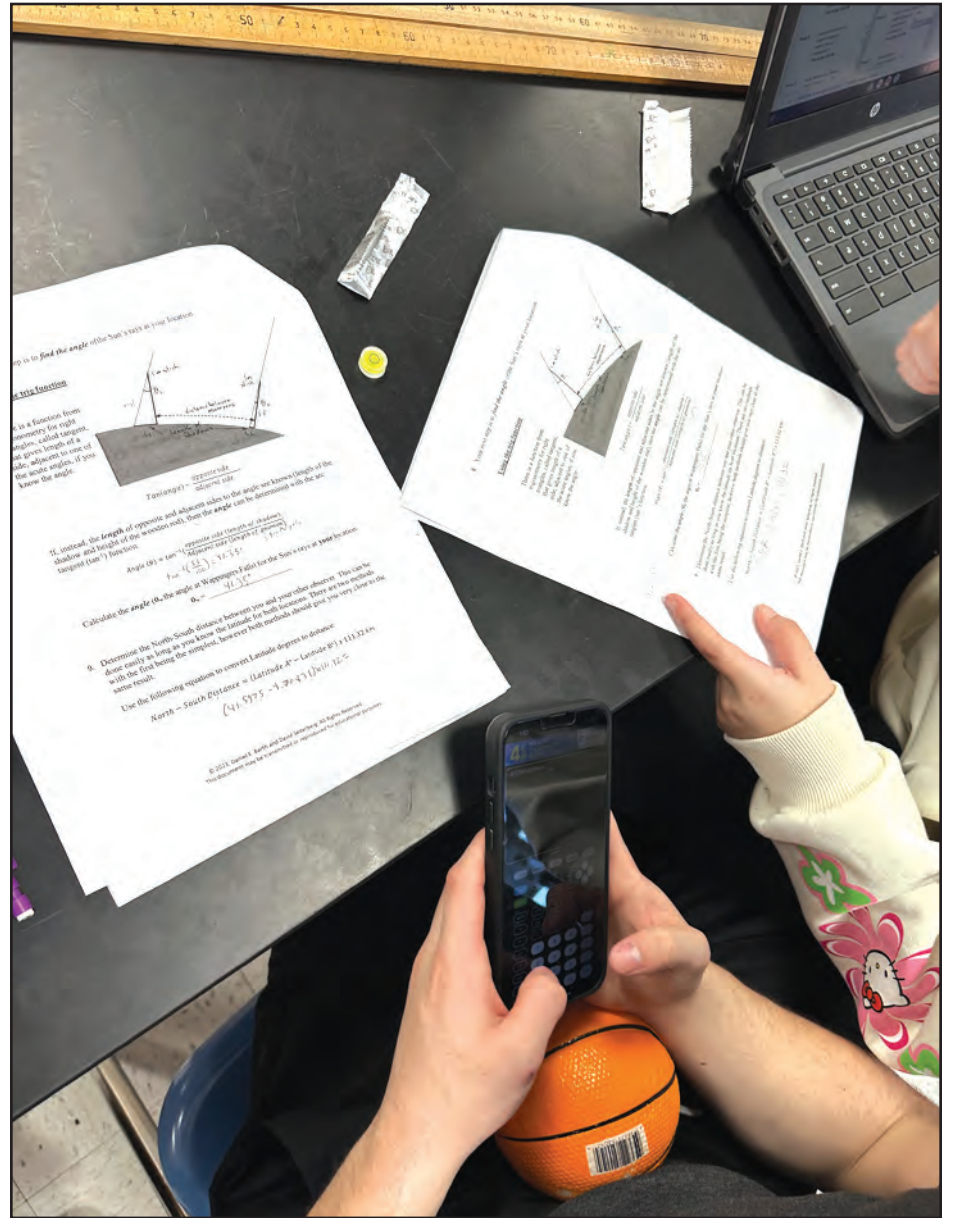


RCK students recreate experiment to determine circumference of the Earth

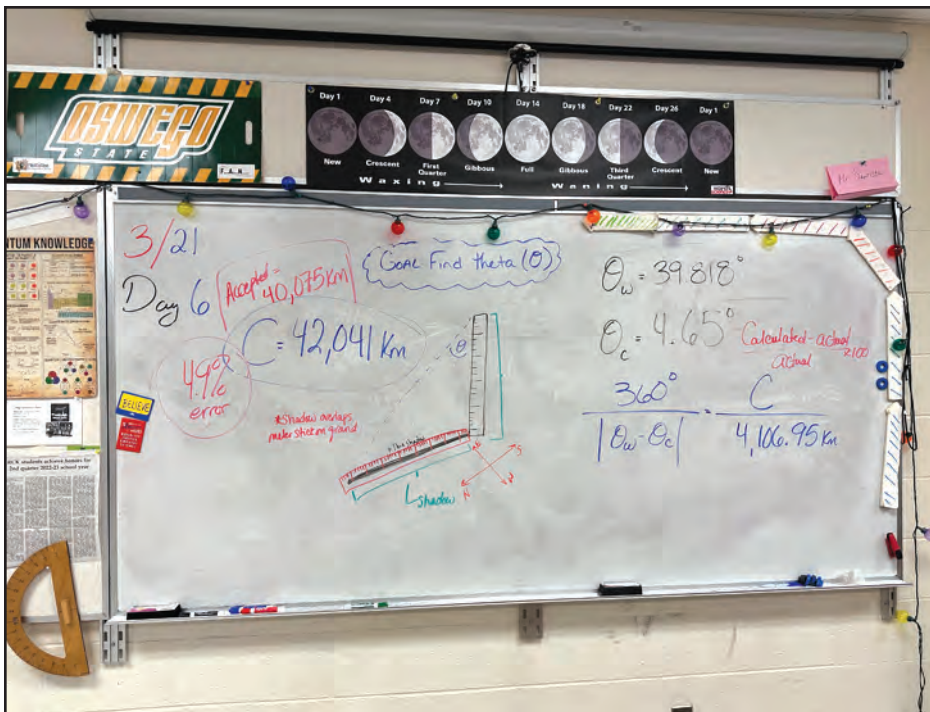


Students in one of Kyle Bautista's classes at Roy C. Ketcham High School work on the circumference of Earth project.



Students work on one of the worksheets during class.

-Courtesy photos



Work done by students in one of Kyle Bautista's classes.

By Kristine Coulter

Students in Kyle Bautista's classes at Roy C. Ketcham (RCK) High School, in the Wappingers Central School District, recently recreated an experiment. The experiment was first performed around 240 B.C. by Eratosthenes, who was a Greek astronomer, geographer, mathematician. Bautista said the goal was to determine the circumference of the Earth.

"Students will be calculating the angle of the incoming rays from the sun and using this angle to compare it to the angle of the sun's rays in Bogotá, Colombia. With a meter stick, students will measure the shadow created at solar-noon. Using trigonometry, students can then determine the angle of the sun's rays. After communicating with Bogotá and getting their data, using a simple proportion, they can determine the circumference within a few percentage points of error," explained Bautista. "I often tell students that as astronomers, the only medium we have to work with is light and this is a clear example of that. This experiment is so simple, but requires creativity and using resources others wouldn't even think of using, like the shadow of a pole!"

One of the students who took part in the lesson was Grayson, a junior at RCK. "Throughout the lesson we simply measured the length of a shadow with meter sticks by exploiting Eratosthenes's discovery of the Earth's circumference, where we then got in touch with students from Bogota, Colombia and calculated the distance and compared our different observations and answers with each other." Grayson continued, "Not only was the experiment very interesting but it was enjoyable to share and communicate with students and even compute Eratosthenes's great observation."

Bautista said that the students who participated are juniors and seniors in one of his two sections of Astronomy class, or his one section of Regents Physics. Altogether, there were approximately 40 students who participated.

Asked what he hopes students learned from the experiment, Bautista responded, "I hope students recognize the beauty of Astronomy and how exciting it can be. I hope students take a moment to value academic curiosity and creativity. As we learn in Astronomy, a lot of ancient astronomers were curious people with a desire to learn more about the world around them. The same can be true for my students today, learn about the world around you, in the classroom and with the people that surround you."

Rafael, a RCK senior, said, "I learned to find the circumference using the easy way using only a meter stick and a circular bubble level. Also, that the angle that we got from Colombia is different because Colombia is closer to the equator which makes the shadow to look smaller."

Grayson commented, "From the experiment I have learned that there is an absolute difference of a shadow's length depending on where you and the sun are located."

Bautista said he invited administrators and staff from the school's yearbook to attend the experiment.

"My hope in inviting people is for my students to identify themselves as true scientists and what they are doing matters. Astronomy is a fascinating subject and the skills they learn in this class are greater than algebra or memorizing the planets. These students are developing creative thinking, communication, leadership, and a desire to learn," said Bautista.

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