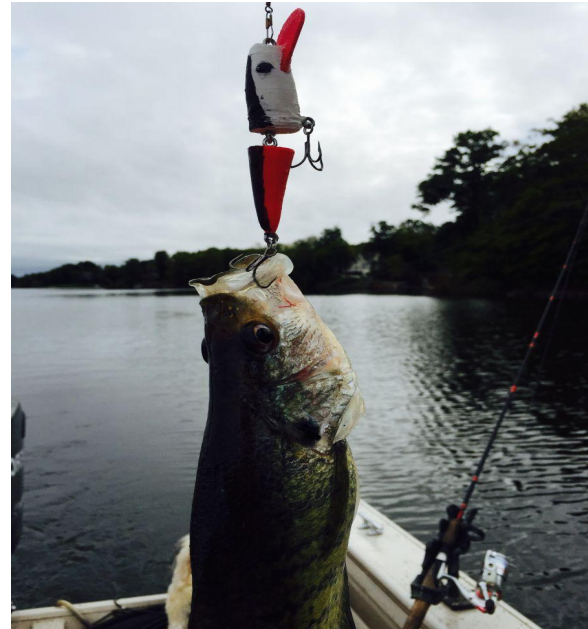


Hooked on Education

Genesis-

This all began with a fortunate accident when a couple of students created a fishing lure that worked surprisingly well well.





Hooked on Education

Hooked on Education is a project that has been funded by the Ohio Department of Education through its Straight A Fund.

The project will teach 30 Fairport Harding High School Students the Ohio Learning Standards embedded in their current schedule, in a less conventional fashion.

The project is designed to give students a better and deeper learning experience by developing community connections, engaging student talents and interests, and personalizing their learning so they can develop all of their “*intelligences*.”



This project is a commitment to place the learner at the center of instruction.

It recognizes the powerful role students must be allowed to play in setting learning goals, planning their learning paths, tracking their progress, and demonstrating their learning as partners and co-designers alongside educators.

It shifts instruction from something we do to learners, to something we do with them.

How are we going to grade this?

The short answer is, “Just like we always have.”

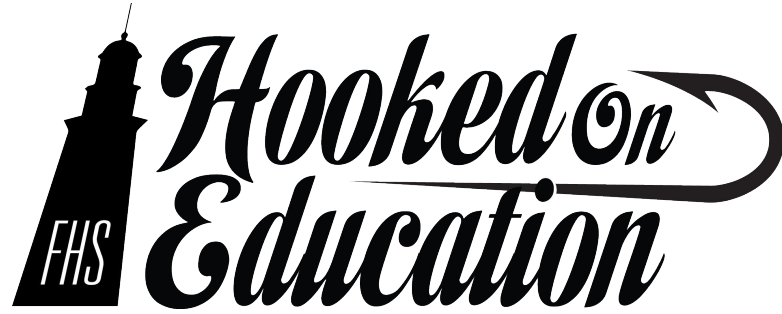
Every student has been issued a schedule. That schedule has classes to which specific **Ohio Learning Standards** are attached. Through *Hooked on Education*, students are going to learn the same standards and be graded on their acquisition of those standards the same as they always have.

Students who learn 90% of the standards associated with a given class will earn an “A” for that class.

Students who learn 80% of the standards associated with a given class will earn a “B” for that class.

Grading may be the same, but how teachers will instruct and how students will demonstrate learning will be very different...

What is a standard?



Simply put, **Learning standards** are concise, written descriptions of what students are expected to know and be able to do at specific stages of their education.

Teachers multitask all of the time!

Does this look familiar?



In English Language Arts, the anchor standard for HS is presented as: “**W.R.912.7**
Conduct short as well as more sustained research projects to answer a question
(including a self-generated question) or solve a problem; narrow or broaden the
inquiry when appropriate; synthesize multiple sources on the subject,
demonstrating understanding of the subject under investigation.”

In a traditional classroom setting, this standard would be addressed in a single instructional unit in the form of a research paper, often in isolation of other subject areas, and rarely revisited in the semester. In other words, it's a “one and done” standard.

In the Design Lab setting, this standard will be embedded in the curriculum. The students will be revisiting the research question as new information is gathered, and will revise the paper or presentation as new understanding is gained, altered, or discarded. The curriculum becomes a living document.

In Social Studies, a typical anchor standard for American Government is “AMG.912.9a Work collaboratively to identify a problem in the school or local community and develop a solution to the problem.” The correlating Language Arts standard is “SL.1.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively”

In a traditional classroom setting, this may be presented as a group project in the classroom with little or no contact with outside collaborators or community members. Students might present a paper, or poster, or powerpoint presentation for a single grade.

In the Design Lab, we will be taking our problem and solution to local business partners and community leadership; as well as inviting community members with an interest in the project to collaborate with us on the project design. Students will be creating a business proposal, and a means to market and promote the product.

Ohio Learning Standards Math “The high school standards are listed in conceptual categories:

• Number and **Quantity** • Algebra • Functions • Modeling • Geometry • Statistics and Probability

Quantities-In real world problems, the answers are usually not numbers but quantities: numbers with units, which involves measurement.

QUANTITIES* N -Q Reason quantitatively and use units to solve problems.

1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
2. Define appropriate quantities for the purpose of descriptive modeling.
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

This is a suggested topic from the ODE’s Model Curriculum on Quantities for the traditional Math classroom:

For example, while driving in the United Kingdom (UK), a U.S. tourist puts 60 liters of gasoline in his car. The gasoline cost is £1.28 per liter The exchange rate is £ 0.62978 for each \$1.00. The price for a gallon of a gasoline in the United States is \$3.05. The driver wants to compare the costs for the same amount and the same type of gasoline when he/she pays in UK pounds. Making reasonable estimates should be encouraged prior to solving this problem. Since the current exchange rate has inflated the UK pound at almost twice the U.S. dollar, the driver will pay more for less gasoline. By dividing \$3.05 by 3.79L (the number of liters in one gallon), students can see that 80.47 cents per liter of gasoline in US is less expensive than £1.28 or \$ 2.03 per liter of the same type of gasoline in the UK when paid in U.S. dollars. The cost of 60 liters of gasoline in UK is £ 76.8 ($£1.28/1 L \times 60L = £ 76.8$). In order to compute the cost of the same quantity of gasoline in the United States in UK currency, it is necessary to convert between both monetary systems and units of volume. Based on UK pounds, the cost of 60 liters of gasoline in the U.S. is £30.41 ($\$3.05/1 \text{ gal} \times 1 \text{ gal}/3.79 L \times 60L \times £0.62978 /\$1.00 = £30.41$).” (Taken directly from ODE Ohio Learning standards Math)

In our curriculum the students will make measurements and determine their own conversion factors and models. For example, the students will measure the amount of line released, they will measure the depth of the lure, and the velocity of the lure. They will then create their own conversion factors to use in a mathematical model to predict the depth of the lure vs amount of line released at different speeds. They will then use their own models to determine the amount of line to release to get to the different depths that fish travel in at different times of the year.

Physical Science (PS-H) Grades 9 - 12

Forces and **Motion**:

Motion can be described in terms of distance, position, displacement, speed, velocity, acceleration and time.

Force has both magnitude and direction. There are many types of forces: friction, normal force, gravitational, magnetic and electrical.

An object's **motion** will not change (will remain at rest or at a constant speed) unless an unbalanced net force acts on it.

Motion The motion of an object depends on the observer's frame of reference and is described in terms of distance, position, displacement, speed, velocity, acceleration and time. Position, displacement, velocity and acceleration are all vector properties (magnitude and direction). All motion is relative to whatever frame of reference is chosen, for there is no motionless frame from which to judge all motion

Investigate the relationship between position and time for a cart that rolls down a ramp from rest. Graph the results. Make a claim about how position and time are related and use evidence to support the claim. Present the findings to the class.

Based on the presentations of other investigations, propose sources of error and provide suggestions for how the experiments can be improved.

In our curriculum, students will have to investigate the motion of their lures as it pertains to speed, depth, line type, etc. students will collect data over many trials and formulate models of the motion of the lure through these investigations. They will investigate variability and error in the motion of different lures of the same type over time and determine the causes of the error to fine tune the motion to mimic bait species.

Content Accumulation vs. Building Learning Capacity

Historically, American schools have placed too much emphasis on the accumulation of content and the ability to memorize and repeat back.

In a slow changing world where facts remain true for long periods of time, this makes some sense.

What is different here?



Pope Benedict's
Inauguration

Pope Francis'
Inauguration

In a rapidly changing world..

Technological advances make rote memorization of large amounts of content impractical today.

“In a world of change, learners inherit the Earth while the learned find themselves perfectly suited for a world that no longer exists.”- Eric Hoffer-

Today's students can live and work anywhere in the world.



Redefining Student Success

Through participation in Hooked on Education, 30 Fairport Harding High School Students will learn the Ohio Learning Standards. The same ones that are represented by classes on their current schedule, but they will be learning the standards in a less conventional fashion.

The project is designed to give students a better and deeper learning experience by developing community connections, engaging student talents and interests, and personalizing their learning so they can develop *all of their intelligences*.

The conventional system of education is good but it isn't good enough.

I think we can all admit that it does have some flaws:

- Standards are often taught in isolation, developing and measuring only logical or linguistic intelligences, with no apparent relevance for the learner.
- Students are instructed in groups in such a fashion that many are held back while others struggle to keep up.
- Time and instruction are constant and as a result learning becomes variable.

Time + Instruction = Learning

Howard Gardner and Multiple Intelligence Theory

Proposed by Howard Gardner in his 1983 book *Frames of Mind: The Theory of Multiple Intelligences*. Gardner articulated eight abilities that he held to meet the criteria of being an area of intelligence:

musical–rhythmic, visual–spatial, verbal–linguistic, Logical–mathematical, bodily–kinesthetic, interpersonal, intrapersonal, naturalistic

Gardner defines an intelligence as biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture. According to Gardner, there are more ways to do this than just through logical and linguistic intelligence. IQ tests only measure linguistic and logical-mathematical abilities, as a result; conventional school is about developing and measuring those alone.

We intend to help students access all of their standards and develop all of their intelligences through their involvement in this project. Thereby, learning more and retaining it longer.

According to Howard Gardner:

Individuation and **pluralization** are the most important educational implications of multiple intelligence theory.

Individuation means knowing as much as you can about each student, giving each student the chance to learn in a way that is most comfortable and to demonstrate learning and understanding in ways that are comfortable. Of course, this is easier to do when you have a smaller class. But you cannot let a large class size defeat the idea of personalized learning, and digital technology makes individualized education a possibility for all students.

Pluralization means deciding what is really important for students to know, learn, and understand and then to convey that information to students in a variety of formats and media, thereby addressing the multiple intelligences. I've never encountered anything of importance that can only be taught in one way. And when you teach pluralistically, you not only reach more students; you also show what it is like to really understand something when you can represent that knowledge in several forms/formats.

Logistics

- Teachers and students will begin the year developing a *Learner Profile*.

This will include their talents, interests, academic history, current schedule with the accompanying standards, and the student's future plans.

- Progress will be monitored and reported using multiple measures that are developed around the strengths of each student and aligned to the standards.
- A great deal of the learning will take place outside the classroom. (Fisheries Station, Charter Boats, Avery Dennison, Bait Stores, etc)
- Students experiencing a declining GPA cannot remain in the project.
- Signed parental consent must be granted for all participants
- Summative Assessments/Final Exams will involve a performance. Possible venues include; Mid-year mixer, Cleveland Sportsmen's Show, Etc.

Personalized Learning Makes Our Project Possible

The power of our model of personalized learning grows out of four interdependent components:

- A detailed understanding or profile of each learner
- A clear set of standards toward which each learner is progressing
- Collaboration with each learner to construct a customized learning path
- A well chosen project that is relevant, embedded in the community, and developed around the talents and interests of our students.

Small Schools are decreasing in number. But it doesn't have to be that way. Small schools can offer personalized learning opportunities better and more often than large schools, but the ones that stick to the industrial model of education are "missing the boat."

