

D86 Science Program Discussion

July 22, 2021

Context: Problems and Solutions Leading Up To and Beyond SY 2021-22 in D86

Identified Areas for Improvement:

1. Science curriculum had not fully integrated all NGSS standards - notably earth science standards - that will be assessed on the IL Science Assessment (juniors) - unless students selected courses in all four science content areas before their senior year.
2. The HC science curriculum lacked a sequence that built concepts and content from one year to the next.
3. Science teachers had few opportunities to collaborate over common curriculum, assessments, instructional practices.

Identified Solutions:

1. Embedded earth science standards across all newly written courses (PITU, COES, BOTLE) to be taken by junior year.
2. Wrote new courses with a sequence in mind so that each provides a foundation for the next.
3. Aligned courses based on aligned standards to provide opportunities for collaboration over assessments and practices

BOE Request: Identify the costs associated with writing and running different science sequences

Important to Note:

- Student course selection determines staffing and teacher schedules: when students select courses in January/February (freshmen in the fall), the staffing process officially begins
- Staffing decisions are typically made with very precise information and over the course of 2-3 months
- D86 maintains a 'flat staffing' fiscal position: Adding staff in one department means considering ways to reduce or offset such increases with reductions in other departments or services.

Factors to consider:

- Staffing (FTE)
- Teacher/Course Preparations and Classroom Space
- Content Certifications
- Class Size & Scheduling Conflicts
- Curriculum Development / Writing

All financial estimates are not intended to be exact; they are informed predictions based on past experiences adding new courses to a master schedule.

Three examples for this presentation...

1. **Stay the Course:** Continue with a D86 Aligned Sequence based on goals of the board-approved Strategic Plan
2. **Modify the Course:** Continue with a D86 Aligned Sequence, and provide the option for students to enroll in the new courses out of sequence (i.e., BOTLE or AP Physics 1 as freshman options)
3. **Chart a New Course:** Create and implement two Separate Sequences - PCB (the current sequence) and BCP (would need to be written)



First: Some context on the **Instructional and Practical Value** of a sequenced curriculum.

1. Instruction is more coherent when the teacher plans lessons, activities, and assessments with the knowledge of what the student has already learned and what the student will be expected to know and do in the next unit and future courses in the same content.
2. Students can feel confident that they are prepared for concepts on local/state/national high stakes assessments (e.g. Final Exams/IL Science Assessment/SAT) as well as the next course in the sequence because courses have been aligned to hit all targets and standards.

Note: All content areas currently have a linear sequence for the reasons above.



Estimated Costs & Considerations associated with Staying the Course: Continue with a D86 Aligned Sequence based on goals of the board-approved Strategic Plan

- **Staffing** - No change
- **Preparations and space** - No change
- **Certifications** - No change
- **Scheduling Conflicts** - No new conflicts created
- **Class Size** - No new class size concerns created
- **Curriculum Development / Writing** - No change

Stay the Course: Continue with a D86 Aligned Sequence based on goals of the board-approved Strategic Plan

9th Grade	PITU <u>or</u> PITU Honors
10th Grade	COES <u>or</u> COES Honors
11th Grade	BOTLE <u>or</u> AP Biology (Electives can be taken concurrently)
12th Grade	AP, Elective, and Capstone Courses

Benefits:

- All curriculum development and writing for the last two years has assumed this model
 - Sequence created by D86 science teachers, SPED teachers, curriculum leaders, and administrators
- All course curriculum is logically and practically sequenced.
- Greater access to AP Biology
- Single sequence significantly reduces staffing, certification, scheduling conflict concerns
- Single sequence increases course availability due to the fact that more sections of the same course are being offered.
- Students experience all four core science content areas before the end of their junior year

Challenges:

- A portion of the community has indicated a desire to have an option to take biology as a freshman

Estimated Costs & Considerations associated with Modifying the Course:

Continue with a D86 Aligned Sequence, and provide the option to enroll in the new courses out of sequence (ex: BOTLE or AP Physics 1 as a freshman)

- **Staffing** - For every section added that is below the D86 class size parameters, there would be a cost of .2 FTE (~\$20,000).
 - *Estimated minimum:* 0.6 FTE at South with the addition of AP Physics 1, BOTLE Honors, AP Physics C-M
- **Preparations and space** - Increasing the number of course offerings (3 at South) adds complexity and workload to scheduling teacher 'preps' and classroom use.
- **Certifications** - For every physics section removed, there would be a reduction of the FTE for existing physics teachers - only 1 current D86 teacher is dual certified in both Biology and Physics.
- **Scheduling Conflicts** - The likelihood of singleton courses also increases on both campuses.
- **Class Size** - With 5 course options (three additional) at the freshman and junior years, the likelihood of low enrollment (under 14) classes increases.
- **Curriculum Development / Writing** - Additional time and funding would be needed to write and align new courses - notably BOTLE Honors and AP Physics 1

Modify the Course: Continue with a D86 Aligned Sequence with an added option of AP Physics 1, and additionally provide the option for students to enroll in the new courses out of sequence (ex: BOTLE as a freshman)

9th Grade	PITU <u>or</u> PITU Honors <u>or</u> AP Physics 1	BOTLE <u>or</u> BOTLE Honors
10th Grade	COES <u>or</u> COES Honors	
11th Grade	BOTLE <u>or</u> BOTLE Honors <u>or</u> AP Biology	Earth Science <u>or</u> AP Physics 1
12th Grade	AP, Elective and Capstone Courses	

Benefits:

- Maintains a logical course sequence as a **recommended** D86 science pathway
- Adds an option to start with Biology via the BOTLE course
- Adds an AP Physics 1 option
- Maintains integrated Earth Science standards in most years

Challenges:

- Removes the benefit of a sequence (for students and teachers) when starting in Biology (BOTLE)
- Creates mixed grade level classes
- Students starting in BOTLE would be taking a course designed as a third year sequenced science course.
- Uneven exposure to Earth Science and Physics standards depending on the student's entry point
- Need time to write/align new courses
- Expected to decrease enrollment in AP Biology

Estimated Costs & Considerations associated with Charting a New Course:

Create and implement two Separate Sequences - ESS-PCB (the current sequence) and BCP (would need to be written)

- **Staffing** - For every section added that is below the D86 class size parameters, there would be a cost of .2 FTE (~\$20,000).

If the Bio class is within class size parameters, a section of Physics would be removed and a Physics teacher will lose 0.2 FTE
 - *Estimated Minimum* 1.0 FTE at South with the addition of five new courses
- **Certifications** - For every physics section removed, there would be a reduction of the FTE for existing physics teachers - only 1 current D86 teacher is dual certified in both Biology and Physics. This could be a yearly concern based on student choice.
- **Preparations and space** - Increasing the number of course offerings (5 at South) adds complexity to scheduling teacher workload and classroom use.
- **Scheduling Conflicts & Class Size** - With 5 course options (five additional) at the freshman, sophomore, and junior years, the likelihood of small (under 14) classes and increased singletons is inevitable on both campuses.
- **Curriculum Development / Writing** - Additional time and funding will be needed to write and align new courses - 1-2 years

Chart a New Course: Create and implement two Separate Sequences - PCB (the current sequence) and BCP (would need to be written)

9th Grade	PITU <u>or</u> PITU H <u>or</u> AP Physics 1	Bio 9 <u>or</u> Bio 9 H
10th Grade	COES <u>or</u> COES H	Chem 10 <u>or</u> Chem 10 H
11th Grade	BOTLE <u>or</u> AP Biology	Earth Science <u>or</u> AP Physics 1
12th Grade	AP, Elective and Capstone Courses	

Benefits:

- Fully aligned sequence regardless of content entry point

Challenges:

- Students starting in Biology may miss content in either physics or Earth science during their high school career, and would definitely miss it by their junior year (SAT/ISA) unless they double up
- Requires **minimum 5** additional courses to be written (aligned to NGSS standards)
- Scheduling complications (small class size and singletons)
- Staffing complications (FTE additions and certifications)
- Would create a likelihood that teachers would have three different course preparations

Parity: Staffing implications outside of science if the decision is made to run science classes outside of D86 class size parameters* (anticipated if we run two separate sequences):

The cost to run a section is ~\$20,000; if we run science classes outside of the class size parameters, the BOE would also need to consider running other classes outside of the parameters.

For the 21-22 school year, to run all classes, unstacked requested by students:

	Central - Running an additional 54 classes (75 instead of 21)	South - Running an additional 28 classes (47 instead of 19)
Additional Classes	54	28
Cost per additional class - Approx	\$20,000.00	\$20,000.00
Total	\$1,080,000.00	\$560,000.00
Total D86 cost to unstack all classes	\$1,640,000.00	

*Room availability and schedule conflicts become complicating factors when adding additional sections

Next Steps

- Using the direction from the BOE, take a recommendation back to the Science Curriculum Development and Writing teams for discussion and planning
 - BOE will need to provide direction to the HR Committee and Administration on course/class size parity and any recommended changes to the D86 staffing framework
 - Oct 14 - Presentation of ESS-PITU, COES, BOTLE standards to BOE
 - Oct 28 - BOE discussion of POS recommendations, including science sequence
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