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Teaching Outside the

An early college program allows students to enroll in college during grades 11–12.

The curriculum in grades 9–10 is designed to challenge students and prepare them for college work.

Teaching strategies stress independent work, critical thinking, and collaboration.

Innovation in teaching is woven into the fabric of DeKalb Early College Academy (DECA), the only early-college program in the DeKalb County (GA) School District. As a high school of choice, DECA accepts applications from all district middle schools and surrounding charter and private schools each year to enroll a new cohort of ninth graders in the fall.

Georgia currently has 10 early-college programs, but the academy is the only one that allows students to enroll full-time in college at the start of their junior year. The 9th and 10th grades consist of accelerated courses to prepare students for early college. Juniors and seniors attend classes on the campus of Georgia Perimeter College, DECA's postsecondary partner institution, where they can earn up to 60 hours of college credit and associate's degrees. Teachers are encouraged to use innovative research-based teaching practices to challenge students academically and foster a college-going culture at the school.

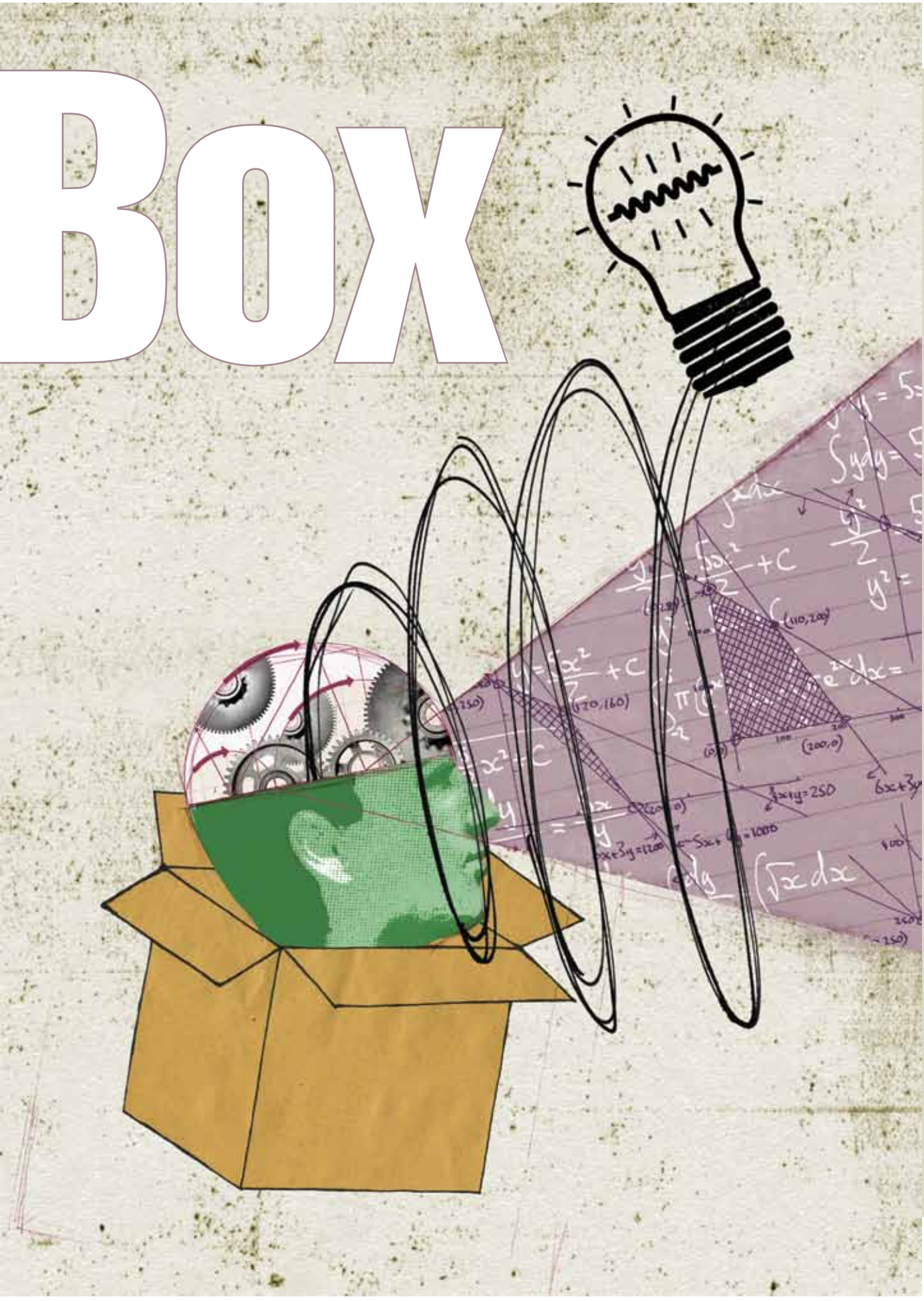
In the last four years, the number of students exceeding standards in various subjects has risen dramatically, particularly in science. DECA offers two science courses: Biology and Physical Science. In spring 2012, 93% of students were proficient on the Biology end-of-course test, and 51% received an exceeds rating. In Physical Science, 100% of students were proficient on their end-of-course test, and 92% received an exceeds rating. One year later on the spring 2013 end-of-course tests, 100% of students were proficient in Biology, and 69% received an exceeds rating; 98% were proficient in Physical Science, and 75% received an exceeds rating. Because of these successes, many of the practices that are used in the science classes are spreading to other departments and classrooms in the school.

An Innovative Approach

All DECA teachers use the six common instructional practices that compose the Early College Instructional Framework developed by Jobs for the Future and the University Park Campus School in Worcester, MA.

- Collaborative group work
- Writing to learn
- Literacy groups
- Questioning
- Scaffolding
- Classroom talk.

Box



The science department takes student-centered learning a step further and has adopted the following instructional strategies:

- Big Twenty Assessments
- Unpacking the standards
- Interactive notebooks
- Harkness discussions
- Problem-based learning (PBL)
- Choice boards for learning
- Flipping instruction and individual student conferences.

BIG TWENTY ASSESSMENTS

Teachers in the science department learned about an approach to assessment for learning at a professional conference. Each state standard for science is divided into 20 blocks, and the teachers devise questions for each block. The teachers then design several assessments in which each question covers 1 of the 20 blocks that students must learn to meet the overarching standard. The questions themselves vary from test to test, but each question assesses students' mastery of a different block.

Students take a Big Twenty Assessment every week, document their results, and immediately create their own remediation plans. That information is documented in students' personal and class folders so that it can be easily shared and reviewed. The test exposes students to the standards they should learn multiple times during the semester and is an excellent way to give teachers, students, and parents data about the students' progress on a regular basis.

UNPACKING THE STANDARDS

To review the concepts that they haven't learned, students unpack the standards that they don't get correct on their weekly Big Twenty Assessments by looking at what they should know and be able to show, explain, discuss, define, and prove.

Students look at the standard in four ways: the vocabulary, a thinking map or a graphic organizer, a problem or diagram, and depth-of-knowledge questions and answers. They begin by identifying the standard related to the missed question. Once identified, the student identifies the words, phrases, and formulas whose meaning he or she does not know or cannot explain.

The vocabulary words are generated based on the standard being unpacked. Vocabulary words and diagrams may be found on the class's dynamic word wall, word ceiling tiles, textbook, class notes, and other class resources. Students have the option to either find or construct a diagram, a concept map, a thinking map, or a mind map that is related to the standard being unpacked. Depth-of-knowledge questions may be posed by the teacher, found in the textbook, or created by the student.

All those components are developed by students with guidance from their teachers. Many students appreciate the process and reference the components on other assignments they complete during the unit. They know that the process helps them identify the most important ideas they need to know.

INTERACTIVE NOTEBOOKS

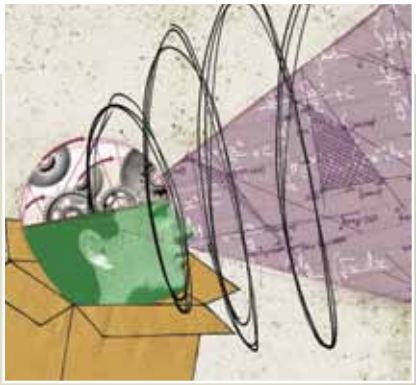
Students in science are required to put together interactive notebooks., which also become portfolios of the students' learning and growth during the year. Students express their own ideas in their notebooks and process the information presented in class. On the left side of the notebooks, students explore diverse methods of demonstrating learning through graphic organizers, diagrams, charts, and so forth. The right side is for teacher input, such as classroom notes, presentations, and other information. Students have many choices about how to show that they know the information, giving them many opportunities for differentiation and extension of learning.

HARKNESS DISCUSSIONS

An innovative strategy shared by the science and English departments is the Harkness discussions developed by Phillips Exeter Academy in Exeter, NH. According to Mullgardt (2008), discussion-based teaching challenges students to sit at the center of education, making meaning of new information together, talking, listening, and ultimately thinking. This strategy includes classroom talk, scaffolding text, collaborative groups, and questioning. Harkness discussions are free flowing, and grading is based on individual and group performance.

During the discussions, hand raising and asking for permission to speak is prohibited. Arguments are prohibited. Varying and differing viewpoints are allowed, but discourse must not escalate to a debate. The Harkness discussion should be led and conducted by the students, but the teacher is present to assist the flow of the discussion in case it deviates too far from the topic.

The physical science classes participated in Harkness discussions that related to the structure of the atom and the periodic table to assess students' understanding of the concepts. Students were given an excerpt about atoms from the poem *De rerum natura* (*On the Nature of Things*) by Lucretius and a *Scientific Journal* article about the periodic table as it relates to earth science. To prepare for their discussions, students annotated the resources, conducted further research, and were assigned group roles. As each four-person group presented their evidence, the rest of the class listened intently and took notes.



Six Common Instructional Practices of Early-College High Schools

Collaborative Group Work
Collaborative group work brings students together in small groups for the common purpose of engaging in learning. Effective group work is well planned and strategic. Students are grouped intentionally and each student is accountable for contributing to the group work. Activities are designed so that students with diverse skill levels are supported as well as challenged by their peers. Collaborative group work uses questioning, scaffolding, and classroom talk and provides the core focus of literacy groups.

Writing to Learn
Writing to learn is a strategy through which students develop their ideas, critical thinking ability, and writing skills. Writing to learn enables students to experiment every day with written language and increase their fluency and mastery of written conventions. Writing to learn can also be used as formative assessment and as a way to scaffold mid- and high-stakes writing assignments and tests.

Literacy Groups
Literacy groups provide students with a collaborative structure for understanding a variety of texts and engaging in a higher level of discourse. Group roles traditionally drive literacy groups by giving each student a role to play and a defined purpose within the group. The specific roles or discussion guidelines may vary for different content areas, lengths of texts, or student level of sophistication using this strategy, but the purpose of literacy groups is to raise student engagement with texts by creating a structure within which they may do so.

Questioning
Students and teachers are challenged to use good questions as a way to open conversations and further intellectual inquiry. Effective questioning (by the teacher and students) deepens classroom conversations and the level of discourse that students apply to their work. Teachers use this strategy to create opportunities for students to investigate and analyze their thinking as well as the thinking of their peers and the authors whose works they read in each of their classes.

Scaffolding
Scaffolding helps students connect prior knowledge and experience with new information. Teachers use this strategy to connect students with previous learning in a content area as well as with previous learning in an earlier grade. Scaffolding also helps facilitate thinking about a text by asking students to draw on their subjective experience and prior learning to make connections to new materials and ideas.

Classroom Talk
Classroom talk creates the space for students to articulate their thinking and strengthen their voices. Students work in pairs, in collaborative groups, and as a whole class. As students become accustomed to talking in class, the teacher serves as a facilitator to engage students in higher levels of discourse. Classroom talk opens the space for questioning, effective scaffolding, and successful collaborative group work and literacy groups.

DeKalb Early College Academy

STONE MOUNTAIN, GA

Grades:
9–12

Enrollment:
277

Community:
Suburban

Demographics:
87% Black, 8% Hispanic, 3% Asian, 2% other; 70% free and reduced-price lunch

Adminstrative team:
1 principal/director and 1 assistant principal

PROBLEM-BASED LEARNING

Another strategy in the science department is problem-based learning (PBL) which is used in many colleges, universities, and schools across the country. PBL incorporates classroom talk, collaborative group work, writing to learn, literacy groups, questioning, and scaffolded texts. Barell (2010) contended that PBL challenges teachers to reconstruct their understanding of problem solving. It takes students from solving homework problems to using advanced thinking skills throughout a unit that is designed around in-depth problem solving. DECA professors have created PBL Cases—projects that require students to conduct research, analyze data, and create a product—and have used others that can be found on Emory University's CASES Online site (www.cse.emory.edu/cases).

In one PBL Case, the Physics of Superheroes, students examine the laws of physics behind superhuman abilities using daily news and current research. Students act out roles as investigative reporters, graphic artists, sports physiologists, and biomechanical engineers to determine whether superheroes live among us in society. They must be able to identify and determine whether various phenomena either defy or adhere to the laws of physics. At the end of the PBL Case, students participate in a Harkness discussion and present claims and evidence that support or refute their original hypotheses. Each student is asked to use their understanding of scientific concepts to create a superhero and super villain and write a short story about how they received their powers.

CHOICE BOARDS FOR LEARNING

Choice boards for learning is a strategy that is based on student choice according to their learning profile data. Teachers create a table of assignment options that are based on the standards. Students select what type of assignment they would like to complete to show what they know and what they are able to do. This strategy helps to meet the diverse needs of the learners in the classroom and is a method of differentiating instruction.

FLIPPING INSTRUCTION

During a faculty meeting early in fall 2012, teachers learned about the practice of "flipping," which was already in use in the science department. Flipping instruction allows students to work at their own pace through online guided activities and learning stations. According to Tucker (2012), the core idea is to flip the common instructional approach: before material is covered in class, students review it at home using teacher-created videos and interactive lessons or videos, such as those from the Kahn Academy. Class becomes the place to work through problems, advance concepts, and engage in collaborative learning. Most importantly, all aspects of instruction can be rethought to best maximize the scarcest learning resource—time.

Flipping gives teachers time to hold individual student conferences to discuss each student's academic progress, examine data, look at the student's work, and develop an action plan for improvement. It is the student's responsibility to self-assess and provide evidence that he or she has mastered the standards. The goal of the science department is to provide opportunities for students to demonstrate their knowledge in various ways that are based on their data results and reflect their learning styles.

To facilitate that goal, teachers are required to gather, analyze, and use data to improve student performance. Class data notebooks contain profiles for each class, the multiple intelligences profile of each student taught, his or her performance on formative assessments, and pre- and post-unit assessments. The data notebooks also include data from multiple sources, such as district-level benchmarks and other assessments.

Conclusion

DECA is committed to using teaching approaches that prepare students for college and careers by exposing them to a rigorous college-preparatory curriculum. Although many of the approaches are nontraditional, they require students to become critical thinkers, problemsolvers, and self-directed learners. **PL**

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