

Playing to Win (and Learn)

INSPIRED BY HHMI'S HOLIDAY LECTURES ON SCIENCE DVDS, A HIGH SCHOOL TEACHER CONJURES UP AN ENGAGING WAY FOR STUDENTS TO LEARN THE SUBJECT MATTER.

YOU'RE ON THE BACKBONE OF A DNA MOLECULE, TRYING TO get down the spiraling staircase structure as fast as possible. You could take the steps (composed of purines and pyrimidines) or race along the railing (made up of phosphates and sugars). The only impediments to your speedy descent are the questions you must stop and answer along the way. Answer correctly and you're free to continue. An incorrect response means your opponents may pass you by.

Sounds like a fun board game, right? It's that, plus a science lesson.

Julie Breeden, a high school teacher at Hampton Roads Academy in Newport News, Virginia, wanted to make her genetics class more engaging. Inspired by HHMI's Holiday Lectures on Science, specifically the 2002 series "Scanning Life's Matrix," she asked her students to design board games to complement those lectures.

Through this exercise, Breeden expected the students to learn a number of important lessons: how to organize information, how to acquire knowledge on their own, how to ask good questions, and how to use their imaginations.

She also had a grander purpose: "I wanted to help ensure that, when the students encounter large and expansive amounts of information in college, they won't be put off by it and will feel comfortable attacking it." She instructed her students to watch the DVD of the lectures several times—making notes on broad topics the first time and adding detailed notes on subsequent viewings. She then asked them to team up in groups of three to brainstorm and build a game.

They surpassed her wildest expectations—and often, their own.

Tyler Branscome, for one, was initially apprehensive. "When I first saw the DVD I got a little scared," she says. "There was a lot of vocabulary that I didn't understand." But eventually she saw it as a valuable exercise that made good use of her creativity.

Branscome and her teammates devised "Journey Through the Human Genome," which features a three-dimensional, DNA model made of doll heads (just for the fun of it) held together by magnetized paint and wires. Using metal pieces, contestants race down the molecule as fast as they can, trying to earn the most points by correctly answering questions that reflect the lectures' content. Simpler questions along the DNA bases award five points and critical-thinking questions along the railing are worth 10 points.

Branscome's methods for finding and choosing her unconventional materials portend a career as a budding scientist.

"When I think of things to do, they are usually a little off base and people don't think they are going to work," she says. "But somehow I research and find the way."



Collective ingenuity was behind this Holiday Lectures on Science-inspired board game assigned by Hampton Roads Academy genetics teacher Julie Breeden (right) and created by her former students (left to right) Alexandra Aloba, Tyler Branscome, and Dasha Afanaseva.

She found magnetic paint online and decided, "well, if you paint something that's round and put it all together with metal wiring then the magnets [game pieces] will stick to the game board and then you can play on it." As for the team's curious choice of doll heads: "It just came to me, but I think it works," she says.

The team's efforts paid off with a finished assignment and better comprehension of the material.

"The way that the game, the DVD, and the questions all come together have made it a lot easier for me to understand the human genome and DNA," she says.

Branscome's classmates were equally successful in coming up with creative board games. One team invented "The Building Blocks of Life," a wooden puzzle that yields a picture of a DNA molecule when pieced together. To complete the picture, players read questions from the lectures found on the bottom of each wooden block and match them to the appropriate answers printed inside the shallow game box. Another team invented a game called "Jumbo Genetics around the World," in which players answer rhyming questions and work their way around a world map printed on a shower curtain. A fourth group designed a flat board game called "Saved at the Centromere," in which contestants vie to be the first to reach the center of a chromosome by coursing down the chromosome's four arms, answering lecture questions as they go.

The project was such a hit, Breeden may ask next year's classes to develop new games, based on the Holiday Lectures DVDs on evolution (2005) and stem cells (2006).

As to whether any of these games could be marketed by companies such as Parker Brothers or Milton Bradley, Breeden doesn't dismiss the notion.

"There's certainly potential," she says. ■ - JACQUELINE RUTTIMANN