SOLUTIONS
BY DESIGN
Some problems are messy, and that’s OK

By Oskie Creech ’92

“Mr. Creech, when are you going to finish the floors?”

asks fifth grader Sophie Cook as she and her classmates enter the Innovation Lab for their weekly Design Thinking class.

As part of an intentional embrace of our School’s motto, “We learn to do by doing,” two rooms on campus are being converted to serve that very purpose: the Innovation Lab near Lower School, and the Makerspace next to the Valmont Courtyard. When the old carpet was removed last fall from the first-floor Palaestra room, a layer of yellow-gold adhesive remained and became part of the new look.

“The floors are finished, Sophie,” I reply. “Don’t they look great?”

“They look messy!” Her hands trace the random pattern in the polished concrete.

“Messy? They’re actually quite clean!”

“Not messy…I mean, they don’t look neat.”

To most students, places of learning have a particular look and feel. Classrooms are defined by an adult teacher, younger students, desks, dry erase or Smart boards, posters, charts, and a general sense of order (or neatness, as Sophie might prefer).

But learning is not neat. Traditional class lessons may present information to students in a tidy and efficient manner, but that information isn’t truly internalized until the student connects it to prior
What Is Design Thinking?

Let’s first be clear about what Design Thinking is not. It’s not a step-by-step, fill-in-the-blank process, nor is it a magic bullet. And it is certainly not a replacement for the excellent teaching that has been at Newman’s core for over 111 years.

At its foundation, Design Thinking is a collection of mindsets that empower students to be creative problem solvers at school and throughout their lives. These mindsets are empathy, an attitude of prototyping, collaboration, iteration, and feedback. Let me define them further:

Empathy Design Thinking is human-centered, and problems are solved with someone other than the designer in mind (known as the “user”). Empathy requires students to see the world through the eyes of another and thereby invent solutions truly meaningful and applicable to the user.

An Attitude of Prototyping According to the Stanford d.school, where Design Thinking was codified into a practice, students must embrace “the notion that if you try something and it doesn’t work, you simply learn from it and try again.” This not only encourages students to aim high, knowing there will be manageable bumps in the road, but also helps to build resiliency in general. A failed attempt is nothing more than feedback saying, “Keep trying!”

Collaboration Group projects in school too often are built upon the division of duties and synthesis of individual work at the end. In Design Thinking, according to the d.school definition, group members “navigate each step in the innovation process together, leveraging their differences as a kind of creative engine.” This approach celebrates and builds off of contrasting viewpoints, resulting in fresh ideas more powerful than any one individual’s.

Iteration Iteration involves repeated testing of an idea or concept in order to improve it. Its power is nicely summed up by a design exercise known as the Marshmallow Challenge, in which participants must build the tallest structure they can from spaghetti, string, and masking tape – with a marshmallow on top. Data collected from over 70 such challenges show that among the people most likely to build the tallest structures are those for whom iteration is most natural… kindergarteners. Repeatedly, our youngest designers outperform MBAs and CEOs simply because they are not afraid to fail fast and fail often.

Feedback The key to productive feedback is the manner in which it is received. Students are taught that feedback is merely data. It should not be viewed as right or wrong, nor should it be taken personally. The most helpful feedback is constructive and specific. We sometimes use the “I Like, I Wish, What If” model promoted by the d.school, where students employ those three prompts to offer feedback that is more collaborative than critical in nature. For receivers of feedback, the best response is not to be defensive or provide a rebuttal, but simply to say, “Thanks for the feedback.”
For decades, schools have focused on the “three R’s” plus subject content and analytical thinking as the core goals for graduating students. But globalization and the advent of the microprocessor have changed the world so dramatically that those skills are no longer sufficient.

Today, students are said to need “21st century skills.” Children must not only be prepared for the world as it exists today, but as it will exist tomorrow. But how can we prepare for tomorrow when we have only a faint idea of how it will look? David Kelley, the founder of IDEO, who also led the creation of the d.school at Stanford, believes the answer is the tendency to think both analytically and creatively.

“I really do believe I was put on the planet to help people have creative confidence,” he said in a 2009 interview. “My contribution is to teach as many people as I can to use both sides of their brain, so that for every problem, every decision in their lives, they consider creative as well as analytical solutions.”

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New Skills for a Dynamic World

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Students share their prototypes from Ms. Swenson’s Design Thinking challenge.

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We Learn to Do by Doing: Design Thinking at Newman

Design Thinking is best understood through examples, so let’s take a look at a recent Newman Middle School challenge.

For some years, Lisa Swenson has asked her 6th grade science students to construct a flashlight. The goal of the project has been for students to gain hands-on experience with simple circuitry. The exercise took one class period, and at the end all materials were left behind for the next group to use.

This year, Lisa decided to transform the flashlight project through Design Thinking. Rather than provide students with a specific problem to solve, she challenged them to “use light to enhance a family member’s experience of walking through your house at night.”

During the course of a week, 6th graders made notes about the lighting in their home, then observed and interviewed a family member to gain insights into their lighting needs. (In Design Thinking, needs are expressed in their most basic terms. An end user might need “a way to see in the dark while walking with both hands full.” A headlamp would be one of many possible solutions to this need.)

After sharing their need-finding notes with group members, students brainstormed possible solutions, chose one, and got to work building a prototype.

This time, when the day came to build circuits, students approached the task within the context of helping a family member. The circuitry lesson was no longer just about energy flowing from the negative to the positive terminal, passing through a switch and a light bulb. It was now, in a small but profound way, about making the world a better place. One student built a tennis shoe for her father that beamed light in 360 degrees. Another designed glasses with a flashlight at each temple for his brother to wear.

Perhaps the most vital part of the lesson was when students sought feedback on the prototypes from their users. One student who had designed a helper robot was asked by her user to add a basket on top to help carry items in the dark. Another user asked a student to redesign a pair of flashlight glasses to hide the on/off switch. Students learned from this feedback that the first solution may not be the best one, that there’s always room for improvement.

“A lot of the kids want to make it and be done with it, but for them to go back and change it is hard,” Ms. Swenson said. She added that the lesson’s lack of a “right answer” was central to its success. “This project had so many open ends, it was great practice for real-world problems they will tackle later on in life.”
It’s simple to imagine Design Thinking in the context of the sciences, but how might these mindsets work in, say, a history class?

For the past year, Robin Vogt has employed Design Thinking principles to projects in her freshman Government and Economic Systems class. For one project, students were asked to wrestle with the compromises of living in a post-9/11 world. They interviewed friends or family about the level of government involvement they were willing to accept in order to feel secure, then designed policies that would balance the privacy concerns of their chosen user with the need for safety.

For another project, students chose a global problem, became experts on that problem as faced by a specific country, and presented possible solutions to their peers for feedback. Freshman Calder Schmidt chose the problem of child warfare in Chad and asked what the U.S. could do to alleviate the issue. After extensive research, Calder concluded that an aggressive approach to eliminating the use of child soldiers in Chad would backfire. However, he thought, since the president of Chad had demonstrated a commitment to raising his country’s standard of living, he could be compelled to crack down on child warfare if the U.S. government pledged aid and support for the country’s education infrastructure.

Calder’s solution was further refined by feedback from his peers and Mrs. Vogt. Still, he believes the key to his success appeared at the early research stage, when he learned about the motivations of the major players in the Chadian government.

“You had to know a lot about your country,” he said. “The solution that might seem obvious at first isn’t necessarily the solution that will work.”

This is music to Mrs. Vogt’s ears.

“As a social science teacher, a major challenge has been to teach students to approach research as something more than a necessary evil, a rote step to check a box,” she said. “I want my students to go beyond the first result in Google. Design Thinking forces them to think about what questions they’re asking and how to find the answers thoughtfully and methodically.”

The project had a profound effect on students. It showed them that solutions to even the most complex problems are within their grasp – provided they put in the effort.

“It just kind of hit me that I can do this,” Calder said. “I can come up with an idea that can change the world. It’s not impossible.”

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Deep, meaningful learning can happen anywhere. The physical surroundings are far less important than the mindset of the people working within. As illustrated by the examples above, Design Thinking can be incorporated into any lesson regardless of where it is taught.

However, Newman is incredibly fortunate to be able to offer our students both an Innovation Lab and a Makerspace where they can explore their creative problem-solving skills using an array of materials and tools. Both are areas where students learn to build physical prototypes for their most creative ideas. The Innovation Lab is primarily for younger students, and holds common supplies such as popsicle sticks and wires and tools such as sewing machines. The Makerspace is intended for Middle and Upper School students and has more sophisticated equipment such as 3D printers (generously donated by Charles Carriere ‘85 and Storey Charbonnet) and laser cutters. These spaces are used throughout the day for lessons, extra-curricular clubs, and even Newman Plus programs.

But alone they are just rooms filled with tools and materials. What is most exciting at Newman right now is the cultural embrace of the notion that the world is ever-changing, and the skills students need for the future are not the same as those of a generation ago. What the new Innovation Lab and Makerspace are to Newman is less about their contents and more about what they represent: open-ended, student-driven, passionate learning, where analytical and creative thinking are inseparable. And yes, both rooms will always be messy.

Oskie Creech ‘92 is the Director of Innovation and Design Thinking for Newman, and he once played the role of a hundred singing chickens in a local production of Fantastic Mr. Fox.

Newman’s Design Thinking program, Innovation Lab, and Makerspace were made possible by the generosity of the following donors:

- The Selley Foundation
- Iberia Bank
- Newman Parents Association