Paper and Productive Learning

The Second Annual Back-to-School Report

Compiled by
The Paper and Packaging Board
2016 Edition

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Introduction: Paper and Productive Learning

The Paper and Packaging Board annually surveys parents, students and educators to understand what it is that makes paper such a timeless partner to learning. Teachers won't abandon it, students rely on it and parents embrace it. Why?

This report explores not only how paper is essential to productive learning, in the classroom and in life, but also the "why" behind these beneficial connections. Former National Teacher of the Year Rebecca Mieliwocki analyzes the survey data and offers tips to maximize the power of the page. Dr. Daniel Oppenheimer, a leading researcher in cognitive psychology at UCLA, discusses the benefits paper brings to preparation and recall, highlighting the importance in identifying which tools foster the best response from individual students.

This year's survey results reveal growth in paper use for learning and capture the steady reliance on the medium for careful contemplation and more authentic interactions in the classroom and beyond.

Relevant to New Audiences

Overall, the results of the 2016 Paper and Packaging Board Productive Learning Survey reveal that paper is thriving, particularly among students. The same students who have never known the world without the internet ("The Mindset List: 2019 List," 2015) and live a life of laptops, tablets and smartphones choose paper when they need to focus and master content. More than four in five college students (87%) agree that paper and packaging are relevant to their daily lives. In a time when everyone is talking about being connected and the "Internet of Things," paper usage continues to grow.

The numbers are startling—especially when considering that today, children often learn to swipe before they learn to write. To give an idea of how prevalent paper usage is, consider that more than three in four college students (82%) always or often use paper tools to prepare for exams.

In a world where technology and internet access are almost ubiquitous, the majority of college students choose to use paper to study for exams. What's more, students are actually using paper more frequently.

In 2016, there was a noticeable uptick in how frequently students use paper. Last year, 41% of college students said they used paper tools for exam preparation all of the time, with an equal number using them "often." This year, students have become heavier users of paper. Almost half of all students (48%) say they always use paper tools for test prep, with 34% using them "often." With so many alternatives at their disposal, students are using paper more when studying. What is it about paper that they find so helpful?

Paper doesn't flash notifications or vibrate when it wants to talk. Paper doesn't come with Wi-Fi and therefore comes with fewer distractions. There's a reason people use terms such as "tabula rasa," "blank sheet" and "turn the page" to indicate they're ready to think and focus and start plans or projects, just as "pencils down" can often mark the end of critical thought in that moment.

Students, along with teachers and parents, intuitively recognize the value of using paper in learning. Paper and Productive Learning: The Second Annual Back-to-School Report brings these benefits to life, exploring the effectiveness and efficiencies to be gained from this medium.

More parents agree (57%) that their child remembers assignments better when he or she writes them down on paper, compared to a year ago (54%).

More than two in five (43%) parents read with their children from a paper book at night, up 5% from last year.

College educators agree that paper is superior to laptops in the classroom. More than eight in ten (82%) can even think of a reason not to allow laptops in class.

The 2016 Paper and Productive Learning Survey Results

Paper is associated with schoolwork. Simply walk into any large retailer during late summer and see shelves overflowing with stacks upon stacks of notebooks and folders in every imaginable size and color.

People feel a spark of adrenaline and possibility when aisles of notebooks and boxes of crisp, blank sheets of paper beckon—pages waiting to be filled. For this year's survey, teachers, professors, parents and students of all ages were asked to help define the role paper plays both as an obvious catalyst in learning and in their everyday lives.
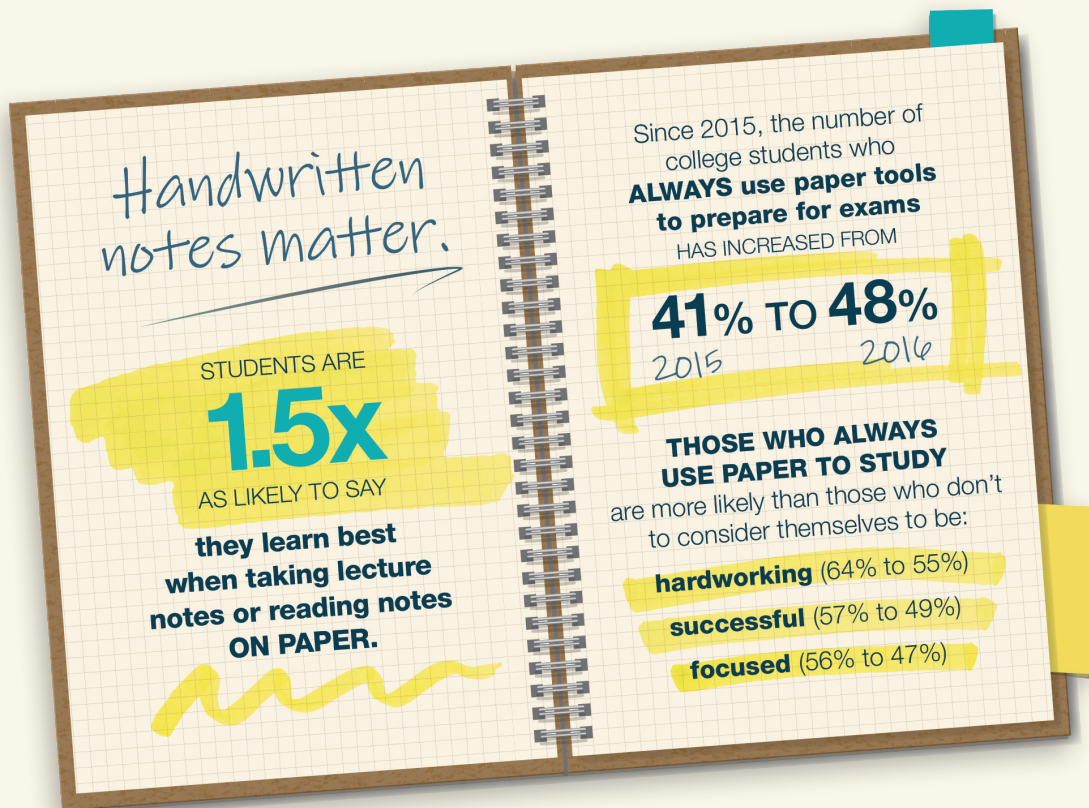
Three central conclusions about the value of paper for learning emerged from this year's survey results. First, paper fosters engagement. Second, paper fosters preparation. Finally, paper is central to commemorating and documenting achievements in ways that help build truly authentic relationships.

More than eight in ten (82%) college students often or always use paper to prepare for exams—using materials such as notecards, handouts, study sheets or printed lecture slides.

As far as overall paper usage goes, on average, per year, college students use 11 textbooks, 11 notebooks and 130 flashcards to study.

Handwritten notes matter.

STUDENTS ARE

1.5x

AS LIKELY TO SAY

they learn best when taking lecture notes or reading notes ON PAPER.

Since 2015, the number of college students who ALWAYS use paper tools to prepare for exams HAS INCREASED FROM

41% TO 48%

2015   2016

THOSE WHO ALWAYS USE PAPER TO STUDY are more likely than those who don't to consider themselves to be:

hardworking (64% to 55%)

successful (57% to 49%)

focused (56% to 47%)

Paper Fosters Engagement

It's true that laptops, tablets and smartphones offer near-limitless access to information. In fact, the most culturally recognizable technology company has made its mission "to organize the world's information and make it universally accessible and useful" ("About Google," 2016).

While information at the ready seems a tremendous benefit, educators know it does not come without distractions.

The majority of college educators (82%) believe there are good reasons for banning laptops in class. These professors believe that such a ban would keep students focused (76%) and engaged (49%). And it's not simply a generational issue: millennial-aged faculty overwhelmingly think there are compelling reasons for minimizing the use of laptops in class. A staggering 91% of them feel this way. In fact, 80% of other-aged faculty agree.

These results translate down to K–12 students as well. Nearly two-thirds of K–12 teachers (64%) feel students comprehend information better and are more engaged (63%) when they read on paper. Close to two-thirds (64%) of K–12 teachers reveal their students even respond better to lessons that are based on paper textbooks. When students hold books in their hands, teachers see more hands raised, and that translates into more participation and engagement.

And it's not just educators who recognize the ways paper aids focus and engagement by minimizing distractions. One pitching coach for a professional baseball team requires the next day's starting pitcher to chart pitches using a pen and paper. The coach believes the process helps the pitcher focus, spot trends and mentally prepare for his turn on the mound (Wagner, 2016).

As noted in the introduction, writing information down on paper is a great way to learn. Students are one-and-a-half times more likely to say they learn best when taking lecture notes or reading notes on paper. Unlike a flashing cursor and verbatim dictation, handwritten notes force students to focus on the material and synthesize it into memorable chunks. One recent academic study confirms this effect, and also found that students who take notes by hand have an easier time recalling the information on tests (Mueller & Oppenheimer, 2014).

Finally, these results apply to learning at home. Moms and dads are more likely to help their children with homework when they are working with paper textbooks, written assignments or hands-on crafts (71%). Again, this isn't a generational preference. Millennial-aged parents, the most proficient with digital technologies, are more likely than other parents (74% vs. 69%) to prefer to help their child with homework on paper as opposed to a computer.

Paper Fosters Preparation

When exam time rolls around, 82% of college students often or always use paper to prepare. If students really want to maximize study time, they should write out flashcards by hand. This allows them to review the material as it is written down.

Another great benefit from taking handwritten notes is visualization. During a test, many students can visualize the very spot on the page where the answer is located in the text. Often, the test-taker can then remember the answer. This kind of visualization is more difficult on a screen because lines of text and pages aren't as easily delineated or distinguished (Mangen, Walgermo, Brønnick, 2013).

College students aren't the only ones preparing on paper; 74% of students in grades 7 through 12 use paper to study for tests. This preparation includes taking handwritten notes, making flashcards or filling out paper worksheets.

According to a recent study from the Pew Research Center, "nearly three-quarters of teens have or have access to a

smartphone" (Lenhart, 2015). That's millions of teenagers with access to billions of bytes of information and countless review and study apps.

Year over year, however, students are just as likely to say they study for exams by taking handwritten class notes (74%), creating flashcards (59%), filling out paper worksheets (58%) or highlighting information in their books (61%).

Simply put, today's students perceive the many benefits of using paper in their learning.

Paper Is Essential to Achievement

Feedback fosters progress and ultimately informs success. This starts in kindergarten classrooms with big red smiley faces on worksheets, extends into college with printed acceptance letters and continues into the professional workplace, as helpful notes are handwritten in margins and sticky notes herald good work.

Educators understand that the learning process is a dialogue. It requires the close engagement and a level of intimacy that only paper can provide. College professors recognize this, evidenced by the fact that the number one way they prefer to give feedback is by making edits or comments on a paper copy of an assignment (55%). Those who prefer to mark edits on a paper copy do so because they feel this type of feedback is personalized (67%), efficient (54%) and clear (52%), facilitates authentic interactions with students (44%) and helps develop relationships with students (35%). Professors understand that feedback is one of the most important parts of the learning process. It deserves the same care and attention that students give to the professors' own material.

Considering paper's significance in the learning process, it's no surprise that it is crucial in documenting achievement.

Parents recognize this and save boxfuls of their children's schoolwork and art projects. Nearly *every* parent (97%) has saved his or her child's paper schoolwork. The biggest reasons parents gave: 65% want to show the child they're proud, 65% want to commemorate the achievement and

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The NUMBER 1 way college faculty like to give feedback is by making their edits and comments on a paper copy of the assignment.

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College educators who prefer to mark edits on a paper copy feel this way because:

☒ It's personalized 67%

☒ It's efficient 54%

☒ It's clear 52%

☒ **It facilitates authentic interactions with students** 44%

☒ It helps develop relationships with students 35%

Paper & Packaging
How life unfolds:

58% want to share the work with a family member or friend. Another reason parents save schoolwork is paper achievements are easier to display. When refrigerators are covered in A-plus artwork or bulletin boards showcase top-notch schoolwork, kids see their work honored, and it makes them feel accomplished.

Conclusions

The results of the 2016 Paper and Packaging Board Productive Learning Survey demonstrate paper's unique and essential role in learning. Paper is unequaled in its ability to improve the whole learning process. It facilitates engagement and the absorption of content. Paper allows students to effectively master content and prepare for exams and papers. Finally, paper provides a personal and authentic medium for providing feedback and commemorating achievement. These characteristics demonstrate the vital and ongoing value of paper even amid today's digital age.

What's more, the results show that we intuitively recognize these traits in paper. We choose paper because we trust it. We've seen the benefits it creates, and we rely on it to obtain information and, ultimately, success.

Paper's Many Merits: An Essay

Rebecca Mieliwocki
2012 National Teacher of the Year

For the last 20 years, I've spent my days teaching 7th grade English. That's right, my work life consists of inspiring 12-year-olds to find their own personal path to greatness. Do you remember what you were like when you were 12? I sure do, and that's why it matters so much to me to be the kind of teacher who lets each kid know how important they are, how much they have to give and that a life of the mind is much more than laughing over a compilation of epic fail videos.

This year, I have a special, new role working with brand new teachers. I help them complete their credential requirements and show them how to survive and thrive in their first year teaching. In both roles and with both groups of people, paper has incredible significance. My students are creating and presenting their work using all manner of paper products. They are note-taking, outlining, writing essays and creating presentations. They are drawing illustrated novels and scripting movies. My newbie teachers are, in many ways, doing the same kinds of things. They are blocking out the year into units, writing lesson plans, creating handouts, writing feedback on student papers, and sending print and email messages to families about school. For me, they are collecting evidence into a portfolio to demonstrate growth toward mastery of the teaching standards. For all of us, paper is omnipresent and invaluable.

It's comforting to see the data from the 2016 Paper and Packaging Board Productive Learning Survey support what we instinctively feel about the role paper plays in our lives.

Paper fosters engagement. Teachers, professors and parents tell us how vital paper is in creating a space where students can get, interact with and make meaning of information they receive in school. Educators use paper to build lessons and shape activities for students, and find that these experiences are often more engaging than computer-based classwork. Not only is paper-based learning powerful for stimulating deeper learning but it also provides an easy avenue for parents to assist their children with schoolwork—something that is essential to school success and family bonding.

Paper fosters preparation. When we use paper to capture and record information, and when we use those paper-based notes to study, our sense of efficacy rises along

with our grades. Students who learn note-taking skills with pen and paper fare better overall than students who try to do the same on computers (Mueller & Oppenheimer, 2014). For teachers, preparing for a great day in the classroom depends on paper. We use our textbooks, interactive notebooks, handouts and paper resources to help our students access our content and make meaning of it.

Paper is central for communicating and documenting achievement. Teachers and professors are always communicating with their students, and that dialogue often comes in the form of feedback written on student work. A majority of teachers and students feel that such feedback is incredibly useful because it's personal, timely and relevant. Teachers also love to highlight achievement by creating "Walls of Fame" where great student work is displayed prominently in the classroom. Parents are no different, and love to save and show off their child's best work. Paper enables this special kind of connection.

When you stop to consider it, paper activates a nearly primitive, positive physical and emotional response in people. Think of all the important ways paper shows up and adds meaning to your life:

- Reading the morning paper
- Holding a novel
- Writing in your journal
- Signing your mortgage papers
- Filling out your first job application
- Stapling together the pages of your very first school report
- Giving and receiving valentines, birthday cards and postcards
- Sending your wedding invitations
- Holding tickets to concerts or ball games
- Carrying your report cards home to Mom and Dad
- Getting your passport stamped

Paper is part of every important, memorable event. Paper allows us to receive and interact with meaningful information, and is a vehicle for sharing our ideas, feelings and values. It allows us to feel connected to the people in our lives and triggers memories that matter most to us. It strengthens connections between students and teachers, parents and children. It sparks feelings of accomplishment and records achievement. Paper is part of how we are productive and learn.

The Relative Advantages of Paper and Digital Media in Education

Daniel M. Oppenheimer
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In the past decade, classrooms have begun to shift away from textbooks, notebooks, pens and pencils and toward electronic media. In college lecture halls, increasing numbers of students are taking notes on laptops, and in high school classrooms, teachers are incorporating computers and tablets into their lesson plans. While there are advantages to electronic media, a growing number of studies show that some educational goals are better achieved using traditional pen and paper methods. Thus, rather than rushing to digitize learning, teachers and administrators should take a step back, consider their desired educational outcomes and assess the extent to which digital media or paper supports the goals of a particular learning experience.

In this paper I will review a few significant ways in which paper and digital media differ, and how those differences affect learning. While the examples below are not exhaustive, I hope that they will be useful in guiding educators regarding how to think about which media best support their classroom goals.

One obvious way in which paper and digital media differ is in the ease of accessing external materials. On laptops, students have the ability to go online, which enables them to access source material, supplemental information and online tutorials. This can help students better understand lessons, and allows for a broader range of classroom activities than would otherwise be possible. However, students with laptops can also access email, social

media, online games and other sources of distraction. While in theory students could resist these diversions, studies have shown that most have tremendous difficulty doing so, and that these sorts of competing demands on students' attention can undermine information processing (c.f. Atchley & Lane, 2014). As such, lessons that require focused attention may be better served using paper, which is devoid of distractions, while lessons that require students to reference external sources or rapidly sift through large quantities of information may benefit from laptop use.

A second way in which laptops and handwriting differ is the speed at which information can be recorded. Most people can type faster than they can write by hand. As such, using laptops to take notes has obvious efficiency advantages, allowing students to transcribe a larger percentage of the material that is covered in a lesson. However, this speed advantage tends to lead students to transcribe content word-for-word, and this can affect the manner in which students process information, and has consequences for their learning. For example, because students cannot handwrite fast enough to take verbatim notes when using paper, they are forced to understand and rephrase the content in their own words. This requires

students to actually think about the material, rather than merely recording it, and by engaging with the material more deeply, students experience more effective learning and consequently perform better on subsequent exams, especially exams involving conceptual understanding (Mueller & Oppenheimer, 2014). In other words, while taking notes on a laptop typically results in a more complete record of a lesson's content, handwritten notes better facilitate learning and often lead to a deeper understanding of the material.

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Paper and digital media also tend to encourage different ways of thinking about the information presented. Students using paper tend to adopt a more concrete mindset (i.e., thinking about how things are done), while those on computers are more likely to adopt an abstract mindset (i.e.,

thinking about why things are done; Kaufman & Flanagan, 2016). This has several implications. Most obviously, paper better supports students who are trying to learn or answer questions about concrete details while computers better support students who are trying to gain a broader or more general overview of the material. Moreover, students thinking at different levels of abstraction focus on different features of texts and therefore accomplish different learning goals. For example, in proofreading, a concrete mindset helps identify typos and low-level grammatical errors, while an abstract mindset helps identify flaws in logical flow or consistency of argument. Consequently, people are better at catching typos when using paper (Wharton-Michael, 2008), but may be better at spotting content errors on computers.

In addition, for reasons that aren't fully understood, students who learn from paper rather than digital media have a better sense of how well they have learned classroom materials. As a result, they are able to allocate more time to the most challenging material in a lesson—material that they (accurately) realize that they have not learned effectively, and thus need to study further. This more efficient allocation of study time can lead to better learning outcomes in situations where students are able to set their own study schedules (Ackerman et al., 2011). Importantly, not only do students' beliefs about how well they understand things lead to more effective study strategies, but such beliefs can also affect motivation (Finn, 2015). Students tend to work harder and study longer when they feel as though they are successfully mastering material. Since paper improves how well calibrated people are regarding what they have learned, lessons that rely on self-assessment of mastery may be more effective with paper.

There are many other ways in which paper and digital media differ with respect to learning. For example, research has shown that reading on a computer screen is more fatiguing than reading paper (Dillon, McKnight and Richardson, 1988). This suggests that paper may be particularly effective for longer lessons, especially when there are limited opportunities for students to rest or take breaks.

Perhaps because of the fatiguing nature of reading from a screen, people tend to prefer reading and learning from paper (Annand, 2008; Spencer, 2006), which could lead to motivational differences and an increased willingness to engage with learning materials. Indeed, online forums about laptop use in classrooms are full of people expressing this preference, with comments such as "I found taking hand notes to be much more enjoyable. I wasn't able to stray onto [social media] or my email, and felt a better connection to the class. Laptops form a physical barrier between the professor and student, and I can recall many a time trying to hide behind the screen of my [laptop]" (Atlantic, 2014).

However, it is worth noting that as computer screens continue to improve in quality, and students become more comfortable and adept with digital media, these differences may diminish. Indeed, some researchers have found differences by age-cohort, suggesting that preferences for paper learning are particularly prevalent in generations that were raised without computers (Eshet-Alkalai & Geri, 2007). Thus, it is important for teachers to consider the age and culture of the student population when determining how to fit paper and digital media into lesson plans.

> **Students who learn from paper rather than digital media have a better sense of how well they have learned classroom materials.**

In sum, paper and digital media require and engender different ways of thinking and therefore produce different educational outcomes. Educators who are considering the adoption of digital media in their classrooms should think through how these differences will interact with their learning goals and lesson plans. Crucially, paper and digital media are not mutually exclusive; both can provide tremendous value in the classroom. As such, educators should not be trying to determine which medium to adopt, but rather when and how each medium can support classroom objectives.

The Paper Path to Productivity

For parents, teachers and students

Rebecca Mieliwocki
2012 National Teacher of the Year

PARENTS & TEACHERS

Doing homework at home

Give your kids a space at home where they can complete their school assignments.

It can be a desk or the dining table, as long as the space is well-lit, clean and relatively distraction-free. Make sure to keep some essential supplies for doing work nearby.

Time management for tweens

Modeling time management for your middle schoolers will prepare them for high school and beyond.

During middle school, there is often a temptation for parents to take a more hands-off approach to their kids' schoolwork in order to teach them responsibility. In reality, your kids need your help more than ever. Show them how to organize and maintain a notebook for daily use. Show them how to make, store and discard stacks of schoolwork, which will prepare them to do this in high school. Kids learn great habits by watching us.

The key to success is reading

Kids who read are more successful developing strong critical thinking and rhetorical skills.

The scientific research on reading is undeniable. Kids who read succeed. They develop stronger vocabularies, understand logical arguments and learn to appreciate (and imitate) voice and style in writing (Cullinan, 2000). The best part is that it doesn't matter what kids readt just that they do. If you can help your child cultivate a love for reading, you will have placed them light-years ahead of most.

Empower students through classroom organization

Organized classrooms empower students and show them the value of organization and responsibility.

Great classrooms have a designated place where papers are turned in and graded work can be picked up. It's important that students know where to go to turn in late work, or how to collect assignments missed due to absence. Kids love a self-serve supply station where they can grab the tools they need to complete a learning activity.

How to lighten the load—literally

Parents need to teach their kids how to sort, store and discard their schoolwork.

Kids need to be taught how to organize their schoolwork. To help, ask your kids each month to take all their schoolwork out of their backpacks. Help them find assignments that still need work, project information sheets and old assignments that might need to be turned in. Archiving important work from past terms is a great way to keep school memories alive while lightening the literal load on your child's back.

STUDENTS

Organize your school self

The single most important thing kids can do to guarantee school success is to get organized.

Make sure you understand your school schedule so you know where you have to be and how long it takes to get there. Also, make sure you have all the supplies and resources your teachers require to be successful in class. That includes having a sturdy binder with tabbed dividers for each class, plenty of paper and a variety of folders for current and long-term projects. Finally, don't forget to keep a supply pouch well-stocked with pens and pencils.

Take notes. On paper.

Note-taking is an essential part of learning and something students need to master quickly.

Where students often go wrong is in trying to rapidly copy every word a teacher or professor speaks. However, the research on note-taking and memory is pretty clear. Students who attempt to copy everything have a difficult time after the fact putting that information in order. Even worse, studies show students who copy lectures verbatim have worse test scores on the same content as students who craft less wordy but more contextually organized notes. The act of manipulating what you hear into bits of information that make sense to you is the key to deeper learning and true understanding. Experiment with different forms of note-taking to see what best suits you. Then,

focus on the critical skill of listening to organize the content during note-taking (Mueller & Oppenheimer, 2014).

Set a goal, and then plan how to get there

Set a project due date and then plan the daily steps needed to do it well and on time.

Backwards planning is something teachers do when they plan an instruction unit. We spend time looking at the content that kids need to master, and then we backtrack and build lessons and activities that will build those skills. It's a terrific skill for kids, too. I teach my students how to backwards plan whenever they have a major assignment to complete. We print out a calendar page, circle the due date, and then break the project into component parts assigned to a day. On each day's calendar square we list the resources they will need to complete that phase of the task.

Want to succeed? Read!

Reading pays dividends that last a lifetime.

In my experience, if you want to be successful, build in at least 15 minutes of reading a day to strengthen your reading muscle and develop a whole host of other skills. I've found that kids who read consistently are able to handle complex texts more easily, develop a much larger vocabulary and see and understand logic better. They often develop voice and style in their writing because they see and imitate great writers they've read.

LIFE-LONG LEARNERS

Live with change through life-long learning

Keep yourself open to learning new things in order to remain confident, nimble and proactive.

The only thing we can count on for certain is that change is inevitable and constant. Learning to live well and happily in times of flux depends completely on your mindset. As painful as it can be to learn new things or let go of old habits, finding a way to see the opportunities in the change is essential. What has served me best is knowing that I have a body of wisdom to leverage but I also leave a fair margin of space for new ideas, practices and information to weave in.

Teach yourself, teach others

Learning something well enough to be able to teach it to others is the highest form of understanding (and immensely gratifying, too!).

As adults, the best way to manage a life filled with exciting opportunities, information and change is to teach yourself something new every year, or learn something new by taking a class or workshop. It doesn't really matter what you learn, just that you learn something new. Take it one step further and deepen your learning by teaching what you know to someone else.

Get outside your own mental zip code

Read about and engage with people, places and ideas that differ from your own to gain perspective.

Even though we are more connected than ever to immediate information and the goings-on of our friends, people are just as able to curate their own digital "gated communities" to linger in exclusively. A smart suggestion is to frequently step out of your mental and digital zip code to meet people, go places and read up on issues that are different than yours. It helps you process different ideas, gain important perspective and grow your wisdom about how the world really is.

Exercise your creative muscle

Create something fun or beautiful that allows you to express yourself.

We live in a time of relative ease and abundance, where tools and resources make it easier than ever to create beautiful, personal and professional things. Craft and hobby shops are filled with art supplies and paper goods that become keepsakes for treasuring. Blank books and journals are enormously popular now, and are perfect for capturing daily thoughts or inspiration. So, in whatever way appeals to you, create something beautiful, fun or useful that allows for self-expression. You'll find it is deeply satisfying.

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