

### Learning Environment: Evidence and Resources

**1. Learning Environment:** The learning environment supports all students to take risks, ask questions, and make and learn from mistakes. The physical space, routines and procedures, and development of positive relationships create a physically, socially, and emotionally safe environment.

#### Supporting Beliefs

- The learning environment is a shared domain between students, teachers, families, and other partners.
- Positive and meaningful relationships are the foundation of a productive learning culture.
- Safety and respect are vital to engagement and risk-taking.

#### Key Traits

##### Physical Space and Routines

- Clear, consistent, and respectful routines, procedures, and expectations are collaboratively established; students know what is expected, when, and why.
- Tools and materials are readily available to students.
- The learning environment can be configured in different ways to best fit the task at hand.
- Students are empowered to use and move around the learning environment in ways that support their learning.

##### Relationships and Culture

- Teachers, students, and families establish and maintain positive relationships.
- Families are included and engaged in a variety of ways to promote student learning.
- All students feel safe to take risks and participate.
- Students are supported in building productive relationships with a variety of classmates across differences.
- Students collaborate with each other throughout the learning process.
- Making multiple attempts and mistakes is expected, accepted, and used as a foundation for further learning.

### Literature Supporting the Element

1. “The physical space of the classroom does not exist independently from the instruction and learning that live there. The wall space, seating, ‘learning zones,’ and materials in the classroom not only support instruction, but also support strong habits of scholarship, independence, and responsibility. Like other aspects of teacher presence—body language, voice, and managing your emotions—the classroom environment is a backdrop to how a student experiences school.”  
—Berger, R., Strasser, D., and Woodfin, L. (2015). *Management in the Active Classroom* (2nd ed.) (p. 23). New York, NY: EL Education.
2. “In short, when students feel a sense of belonging in a classroom community, believe that their efforts will increase their ability and competence, believe that success is possible and within their control, and see work as interesting or relevant to their lives, they are much more likely to persist at academic tasks despite setbacks and to demonstrate the kinds of academic behaviors that lead to learning and school success.”  
—Farrington, C.A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T.S., Johnson, D.W., & Beechum, N. (2012). *Teaching Adolescents to Become Learners. The Role of Noncognitive Factors in Shaping School Performance: A Critical Literature Review* (pp. 29-30). Chicago: University of Chicago Consortium on Chicago School Research.



3. “In summarizing the research on parent involvement, it becomes very clear that extensive, substantial, and convincing evidence suggests that parents play a crucial role in both the home and school environments with respect to facilitating the development of intelligence, achievement, and competence and their children.”  
—Becher, R. M. (1984). *Parent Involvement: A Review of Research and Principles of Successful Practice* (p. 39). Washington, DC: National Institute of Education.
4. “Transformationist pedagogy means teaching and leading in such a way that more of our students, across more of their differences, achieve at a higher level, more of the time, without giving up who they are. In the transformationist classroom the price of success is not assimilation (‘acting White’), but rather a process of deep engagement with authentic identity and one’s own intellectual efficacy. The reward in such classrooms is that everyone gets smarter together, including the teacher, while at the same time maintaining, strengthening, and honoring our differences.”  
—Howard, G. R. (2006). *We Can’t Teach What We Don’t Know: White Teachers, Multiracial Schools* (2nd ed.) (p. 133). New York, NY: Teachers College Press.
5. “Students who are surrounded by disbelieving peers and discouraging adults, or who suffer from institutional labels that predict underperformance (such as “remedial,” “SpEd,” or anything other than “gifted and talented,” or “advanced placement”), may find it difficult to generate the motivation to attempt challenging tasks. Therefore it’s important that we manage those social expectations, too, through strong and responsive classroom management techniques and reflections on our own beliefs about what’s possible for our students and ourselves. We might even need to reconsider and reform the way we test, sort and rank students by ‘ability.’ After all, no learning environment will be successful if students don’t believe they will succeed.”  
—Toshalis, E. (2015). *Make Me!: Understanding and Engaging Student Resistance in School* (p. 106). Cambridge, MA: Harvard Education Press.
6. “You know, great classrooms are places where kids are not just listening to the teacher, but they are also learning from each other, learning with each other, and problem solving together. For that to happen, teachers actually have to teach kids how to work together, and teach them that working together does not mean copying someone else’s work, but it really means each person is taking responsibility for their contribution. If you are able to create an environment where kids are working together, it is easier for teachers to address the individual needs of children.”  
—Rea, D.W. (2015). Interview with Pedro Noguera: How to Help Students and Schools in Poverty. *National Youth-At-Risk Journal* 1(1), 11-21.
7. “Engaged pedagogy does not seek simply to empower students. Any classroom that employs a holistic model of learning will also be a place where teachers grow, and are empowered by the process. That empowerment cannot happen if we refuse to be vulnerable while encouraging students to take risks.”  
—Hooks, B. (1994). *Teaching to Transgress: Education as the Practice of Freedom* (p. 21). New York, NY: Routledge.
8. “Learning occurs in every social, intellectual, and procedural transaction between the teacher and students and among the students. Therefore, it is important to foster positive, caring relationships with other students and the teacher in the classroom. Because relationships matter, who you are and what you know and can do matters. While a teacher may have the ideas that being colorblind and ignoring differences shows equal acceptance of all, even young students are very aware of their differences. Instead, in identity safe environments, student differences are recognized and validated. Consideration is given to every aspect of the classroom, to all the subtle and overt messages that recognize that diverse ideas, perspectives, and materials can actually enhance learning.”  
—Steele, D. M., & Cohn-Vargas, B. (2013). *Identity Safe Classrooms: Places to Belong and Learn* (p. 8). Thousand Oaks, CA: Corwin.
9. “When considering an environment where students are constructing their own understanding, educators may conclude that a teacher has nothing to do. On the contrary, a teacher’s role in a constructivist class is no less critical than the teacher’s role in a traditional class. It is different. Teaching no longer focuses solely on making presentations (although those are still sometimes appropriate) or assigning questions and exercises. Instead, teaching focuses on designing activities and assignments—many of them framed as problem-solving—that engage students in constructing important knowledge.”  
—Danielson, C. (2017). *Enhancing Professional Practice: A Framework for Teaching* (2nd ed.) (p.17). Alexandria, VA: Association for Supervision and Curriculum Development.
10. “To find the core of a school, don’t look at its rulebook or even its mission statement. Look at the way the people in it spend their time—how they relate to each other, how they tangle with ideas. Look for the contradictions between words and practice, with the fewer the better.”  
—Sizer, T.R., & Sizer, N.F. (1999). *The Students are Watching: Schools and the Moral Contract* (p. 18). Boston, MA: Beacon Press.

## Resources and Readings

### Brief Articles

1. Haberman, M. (1991). The Pedagogy of Poverty Versus Good Teaching. *Phi Delta Kappan*, 92(2).  
*This article outlines the common practices of pedagogy performed in urban schools and details the problems with these common approaches. In addition, it explains the ways in which teachers can shift their pedagogy to better serve poor students including crafting learning environments that engage and challenge students.*
2. Stewart, E., Rebollar, E., Howle, H., & Patterson, M. (2016, October 13). Lift Every Voice: Classroom Essays from Our 2016 Fishman Prize Winners. Brooklyn, NY: TNTP. Retrieved from <https://tntp.org/publications/view/teacher-training-and-classroom-practice/lift-every-voice>.  
*This series of essays by classroom teachers explores the ways in which the relationships they build with students, families, and communities impact what and how they teach.*
3. Davis, C. (2001, February 1). Ending the Day Right. *Responsive Classroom*. Retrieved from <https://www.responsiveclassroom.org/ending-the-day-right>.  
*This article offers ideas for creating good endings to the school day. Several educators reflect on the “closing meeting” process and ways it can be used to bring the school day to a peaceful end.*

### Books and Reports

1. Berger, R., Strasser, D., & Woodfin, L. (2015). *Management in the Active Classroom*. (2nd ed) (p. 23). New York, NY: EL Education.  
*This book presents resources in two parts—Foundational Structures and Practices that support active learning in the classroom and Protocols and Strategies that build collaborative environments where students take responsibility for their learning. The tools and resources are widely applicable across grade level and content area.*
2. Daniels, H., Bizar, M., & Zemelman, S. (2001). *Rethinking High School: Best Practices in Teaching, Learning and Leadership*. Portsmouth, NH: Heinemann.  
*This book is organized around best practices in teaching and learning related to areas including school climate, community experiences, and relationships.*
3. Fisher, D., Frey, N., & Pumpian, I. (2012). *How to Create a Culture of Achievement in Your School and Classroom*. Alexandria, VA: Association of Supervision and Curriculum Development.  
*Fisher, Frey, and Pumpian believe that no school improvement effort will be effective unless school culture is addressed. They identify five pillars that are critical to building a culture of achievement.*
4. Ferguson, R.F., Phillips S.F., Rowley, J., & Friedlander, JW. (2015). *The Influence of Teaching. Beyond Standardized Test Scores: Engagement, Mindsets, and Agency*. The Achievement Gap Initiative, Harvard University. Retrieved from <http://www.agi.harvard.edu/projects/TeachingandAgency.pdf>.  
*This report examines how classroom contexts affect noncognitive factors, especially student agency. The report is based on data collected from schools ends by exploring the implications of the research on classroom and instructional practices.*
5. Henderson, A., & Berla, N. (Eds.) (1994). *A New Generation of Evidence: The Family is Critical to Student Achievement*. St. Louis, MO: Danforth Foundation. Retrieved from [https://archive.org/stream/ERIC\\_ED375968/ERIC\\_ED375968\\_djvu.txt](https://archive.org/stream/ERIC_ED375968/ERIC_ED375968_djvu.txt).  
*This report reviews the research in 66 studies that consider the impact of family on student educational achievement and summarizes key findings.*
6. OWP/P Architects, VS Furniture, Bruce Mau Design. (2010). *The Third Teacher: 79 Ways You Can Use Design to Transform Teaching & Learning* (1st ed). New York, NY: Abrams.  
*This book explores the link between the school environment and how children learn, and offers practical design ideas to improve schools. The book is intended for educators, education decision-makers and community members.*
7. Rajagopal, K. (2011). *Create Success!: Unlocking the Potential of Urban Students*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*This book a model for teaching that unleashes the potential of students who may have failed or struggled throughout their school careers. Rajagopal’s CREATE model for closing achievement gaps helps educators improve their instructional approach for all students, especially those who are underserved in urban classrooms. Using examples*

from math, language arts, and other subjects, he explains how to achieve success with even the most disruptive and disengaged students.

8. Steele, D. M., & Cohn-Vargas, B. (2013). *Identity Safe Classrooms: Places to Belong and Learn*. Thousand Oaks, CA: Corwin.  
*This book focuses on translating research into practice, outlining the domains of child-centered teaching, cultivating diversity as a resource, classroom relationships and caring environments as critical to creating learning environments that promote success for all students. The authors describe practices that support each domain and common challenges related to that domain, ending each section with questions to help teachers implement the practices.*
9. Tomlinson, C.A., Ford, D., Reis, S., Briggs, C., & Strickland, C. (2004). *In Search of the Dream: Designing Schools and Classrooms That Work for High Potential Students from Diverse Cultural Backgrounds*. National Association for Gifted Children. Storrs, CT: National Research Center on the Gifted and Talented.  
*This book presents guiding principles for culturally diverse environments and curricular choices to support multicultural inclusiveness.*
10. Tomlinson, C.A., & Imbeau, M. (2010). *Leading and Managing a Differentiated Classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*This book presents ideas for how to address student differences in thoughtful ways. The book is broken into parts-- the first half of the book focuses on what it means for a teacher to effectively lead a differentiated classroom and the second half of the book focuses on managing a differentiated classroom.*
11. Toshalis, E. (2015). *Make Me!: Understanding and Engaging Student Resistance in School*. Cambridge, MA: Harvard Education Press.  
*This book explores student resistance through a variety of perspectives, arguing that oppositional behaviors can be not only instructive but productive. According to Toshalis, the focus of teachers' efforts should not be about "managing" adolescents but about learning how to read their behavior and respond to it in developmentally productive, culturally responsive, and democratically enriching ways.*
12. Toshalis, E., & Nakkula, M. (2012, April). Motivation, Engagement, and Student Voice. *The Students at the Center Series*.  
<http://studentsatthecenterhub.org/wp-content/uploads/2012/04/Exec-Toshalis-Nakkula-032312.pdf>.  
*In this report the authors review research on achievement, motivation, school engagement, and student voice. The report explores what works and highlights the importance of fostering student voice and empowerment.*

## Videos

1. Teaching Channel. My Favorite No: Learning from my Mistakes.  
Retrieved from <https://www.teachingchannel.org/videos/class-warm-up-routine>
2. Teaching Channel. Group Contracts for Collaborative Work.  
Retrieved from <https://www.teachingchannel.org/videos/group-contracts-ntn>
3. Edutopia. 5-Minute Film Festival: Classroom Makeovers to Engage Learners.  
Retrieved from <https://www.edutopia.org/blog/film-festival-learning-spaces-classroom-makeovers>
4. Rosalia Films. World Peace and Other 4th Grade Achievements, Extended Trailer. (2010, September 7).  
Retrieved from <https://www.youtube.com/watch?v=ICq8V2EhYs0>
5. TED. John Hunter: Teaching with the World Peace Game. (2011, March)  
Retrieved from [https://www.ted.com/talks/john\\_hunter\\_on\\_the\\_world\\_peace\\_game](https://www.ted.com/talks/john_hunter_on_the_world_peace_game)
6. Coalition of Essential Schools. Second Year Algebra: Coaching a Lab Investigation.  
Retrieved from <https://vimeo.com/album/3850193/video/158827152>
7. EL Education. Setting Up Your Classroom Environment.  
Retrieved from <https://eleducation.org/resources/setting-up-your-classroom-environment>
8. EL Education. Connecting Class Norms to Schoolwide Norms.  
Retrieved from <https://eleducation.org/resources/connecting-class-norms-to-schoolwide-norms>

## Clear, Shared Outcomes: Evidence and Resources

**2. Clear, Shared Outcomes:** The learning outcomes are shared and internalized by teachers and students. These outcomes anchor and guide the choices of instructional activities, materials, practice assignments, and assessment tasks. Outcomes are understood and used by students to set goals, guide learning, and prompt self-reflection.

### Supporting Beliefs

- Everyone involved in the learning process must know where they are going and why the work matters.
- Teachers and students need to be invested in the learning process to achieve outcomes.
- A culture of reflection is necessary for students to set and adjust personalized goals.

### Key Traits

- Learning outcomes are clear—both long-term (e.g., graduation standards and performance indicators) and short-term (e.g., learning targets).
- Clear descriptions of what success looks like are established and shared.
- Materials, activities, and assessment tasks are selected by teachers and students to align with the learning outcomes.
- Students can explain how tasks and experiences align to learning outcomes.
- Students use standards and learning targets to reflect on their own progress and set goals for growth.

## Literature Supporting the Element

1. “In selecting instructional outcomes, then, teachers should consider the importance of the outcomes they select for students both now and for what future learning the outcomes make possible. Instructional outcomes should represent important learning, high expectations for students, and intellectual rigor.”  
—Danielson, C. (2007). *Enhancing Professional Practice: A Framework for Teaching* (2nd ed.) (p. 51). Alexandria, VA: Association for Supervision and Curriculum Development.
2. “In objective-driven lessons, teachers are constantly focused on what they want students to learn and how they want students to demonstrate they have learned it. While teachers attend to the objective, they also focus on how each student is progressing toward learning the objective. Teachers plan, monitor, and adjust their teaching so that there is a high likelihood that all students will master the lesson objective.”  
—Johnson, J. F. Jr., Perez, L.G., & Uline, C.L. (2013) *Teaching Practices from America's Best Urban Schools: A Guide for School and Classroom Leaders* (pp.10-11). New York, NY: Routledge.
3. “Goals are the reason classroom activities are designed. Without clear goals, classroom activities are without direction. Researchers Joseph Krajcik, Katherine McNeill, and Brian Rieser (2007) explain that good teaching begins with clear learning goals from which teachers select appropriate instructional activities and assessments that help determine students’ progress on the learning goals.”  
—Marzano, R. J. (2009). *Designing and Teaching Learning Goals and Objectives* (p. 4). Bloomington, IN: Marzano Research Laboratory.
4. “The increased emphasis on differentiated instruction and the momentum of project-based learning and personalized learning highlight an important shift happening in education: the move toward a more student-centered approach to teaching and learning. Interestingly, this movement comes on the heels of the push toward standards and academic

accountability that caused everyone to tighten their collective grips on what students did and how they did it. It's important to recognize that these two seemingly very different movements don't need to be at odds with one another; teachers should be able to personalize learning within the context of academic standards. It does, however, require that teachers shift their instructional strategies, and choice may be one of the best vehicles for getting there, for it allows teachers and students to share in the responsibility of teaching and learning. Teachers can create viable options that students will find compelling and appropriately challenging, and then students take responsibility for choosing options that will best help them learn."

—Anderson, M. (2016). *Learning to Choose, Choosing to Learn: The Key to Student Motivation & Achievement* (pp. 16-17). Alexandria, VA: Association for Supervision & Curriculum Development.

5. "Our lessons, units, and courses should be logically inferred from the results sought, not derived from the methods, books, and activities with which we are most comfortable. Curriculum should lay out the most effective ways of achieving specific results. It is analogous to travel planning. Our frameworks should provide a set of itineraries deliberately designed to meet cultural goals rather than a purposeless tour of all the major sites in a foreign country. In short, the best designs derive backward from the learnings sought."  
—Wiggins, G., & McTighe, J. (2006). *Understanding by Design* (2nd ed.) (p. 14). Upper Saddle River, NJ: Pearson.
6. "We have found that many schools now require teachers to write a daily objective on the board for students. That's a useful practice so that students have something to refer back to, but posting it is nowhere near sufficient. It has to be accompanied by making sure students know what it is and what it means. The point is that learning is empowered when students understand what they are aiming to learn, and something has to happen beyond posting the objective on the board to ensure that student understanding."  
—Saphier, J., Gower, R., & Haley-Speca, M. (2008). *The Skillful Teacher: Building your Teaching Skills* (6th ed.) (p. 164). Acton, MA: Research for Better Teaching.
7. "Clearly stated learning intentions are an essential component of formative assessment strategy. They help teachers to be mindful of what their goals are to effectively plan and deliver lessons and they facilitate student learning by communicating expectations about the desired outcomes for each lesson. As a result, experts assert, "research on instructional techniques in all core content areas has found that explicitly linking classroom activities to learning goals helps students understand the purpose of the instruction and feel motivated to engage with the ideas." (Reed, D.K, May 2012) This is particularly true for underachieving students who benefit from a clear understanding of where each lesson is going."  
—Hanover Research. (2014). *The Impact of Formative Assessment and Learning Intentions on Student Achievement*. Washington, DC: Hanover Research. Retrieved from <http://www.hanoverresearch.com/media/The-Impact-of-Formative-Assessment-and-Learning-Intentions-on-Student-Achievement.pdf>.
8. "If you want your students' learning to be at the higher levels—appreciating the complexity of the natural world, for example, or seeing how human history is told in multiple ways—you can write objectives aimed to target this kind of achievement. After all, the thinking and performance of the great scholars in any field are described by their colleagues in terms of analytical ability, creative synthesis, and insightful evaluation. If their thinking and performance can be so described, so can our students'."  
—Reeves, A. R. (2011). *Where Great Teaching Begins: Planning for Student Thinking and Learning* (p. 32). Alexandria, VA: Association for Supervision & Curriculum Development.
9. "Learning can be enhanced to the degree that students share the challenging goals of learning, adopt self-assessment and evaluation strategies, and develop error detection procedures and heightened self-efficacy to tackle more challenging tasks leading to mastery and understanding of lessons."  
—Hattie, J., & Timperley, H. (2007, March). The Power of Feedback. *Review of Educational Research*, 77(1), 83. Retrieved from <http://education.qld.gov.au/staff/development/performance/resources/readings/power-feedback.pdf>.
10. "...[T]hinking after completing tasks is no idle pursuit: It can powerfully enhance the learning process, and it does so more than the accumulation of additional experience on the same task. Performance outcomes, we find, can be augmented if one deliberately focuses on learning from experience accumulated in the past. Results from our studies consistently show a significant increase in the ability to successfully complete a task when individuals are given the chance to couple some initial experience with a deliberate effort to articulate and codify the key lessons learned from such experience."  
—Di Stefano, G., Gino, F., Pisano, G.P., & Staats, B.R. (2016, June 14). *Making Experience Count: The Role of Reflection in Individual Learning*. Harvard Business School. Retrieved from [http://www.hbs.edu/faculty/Publication%20Files/14-093\\_defe8327-eeb6-40c3-aafe-26194181cfd2.pdf](http://www.hbs.edu/faculty/Publication%20Files/14-093_defe8327-eeb6-40c3-aafe-26194181cfd2.pdf).

## Resources and Readings

### Brief Articles

1. Berger, R., Rugen, L., & Woodfin, L. (2014). *Leaders of Their Own Learning: Transforming Schools Through Student-Engaged Assessment*. San Francisco, CA: Jossey-Bass.  
*These resources are excerpted from a longer chapter of this text on the purpose, design and use of learning targets and include a chart outlining teacher and student responsibilities or actions related to learning targets and a brief overview of how to write learning targets.*
2. Wilson, D. (2015, May 22). Inspiring Progress Toward Learning Goals. *Edutopia*. Retrieved from <https://www.edutopia.org/blog/inspiring-progress-toward-learning-goals-donna-wilson-marcus-conyers>.  
*In this post, the authors describe the impact of reflection and metacognition about learning on future learning and motivation, outlining several strategies to promote and capitalize on metacognition to impact achievement and inform goal setting.*
3. Elder, Z. (2012, October). Constructing Learning So That it is Meaningful and Purposeful. *Full On Learning*. Retrieved from <https://fullonlearning.com/2012/10/01/constructing-learning-so-that-it-is-meaningful-and-purposeful/>.  
*This short blog talks about a small shift that can be made to learning objectives to increase their impact on student learning. This is done by linking explicitly to the reason students need to know what they are learning or practicing.*
4. Marzano, R. J. (2011, May) Art and Science of Teaching/Objectives That Students Understand. *Schools, Families, Communities*, 68(8), 86-67.  
*This brief article describes several effective and ineffective ways to use learning objectives with students.*
5. Moss, C. M., Brookhart, S. M., & Long, B.A. (2011, March). Knowing Your Learning Target. *What Students Need to Learn*, 68(6), 66-69.  
*This article explains the importance of learning targets, the challenges encountered by one school as they moved to using learning targets and the impact making that change had for teachers and students.*

### Books and Reports

1. Johnson, J., Uline, C., & Perez, L. (2013). *Teaching Practices from America's Best Urban Schools: A Guide for School and Classroom Leaders* (1st ed.). New York, NY: Routledge.  
*This book profiles the patterns in practice among award winning urban schools that have a strong record of producing equitable results across all demographic groups. Chapter 2 in particular focuses on the role of objectives and how they are used in the classroom to help students achieve mastery.*
2. Marzano, R. J. (2009). *Designing and Teaching Learning Goals and Objectives: Classroom Strategies That Work*. Bloomington, IN: Marzano Research Laboratory.  
*This book provides a comprehensive overview of the research and theory behind learning objectives as well as resources and guidance related to developing specific learning goals. There are additional chapters related to attending to cognitive demand, noncognitive goals, and thinking of learning goals in a sequence.*
3. Moss, C. M., & Brookhart, S. M. (2012). *Learning Targets: Helping Students Aim for Understanding in Today's Lesson*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*This text begins with an explanation of why learning targets matter and how to write them as well as how to use them with students. The author then discusses using learning targets to differentiate instruction, promote higher order thinking, and for summative assessment and grading. There are many examples and practical tools included in the text as well.*
4. Reeves, A. R. (2011). *Where Great Teaching Begins: Planning for Student Thinking and Learning*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*This book identifies learning objectives—and specifically those focused on student outcomes—as a foundation for learning, then connects those to assessments and instruction in later chapters. The author explains the contrast between seeing and designing learning with an activities mindset versus that of an outcomes or learning mindset and offers many tips and tools for creating learning focused objectives.*
5. 5. Hanover Research. (2014). *The Impact of Formative Assessment and Learning Intentions on Student Achievement*. Report. Washington, DC: Hanover Research. Retrieved from <http://www.hanoverresearch.com/media/The-Impact-of-Formative-Assessment-and-Learning-Intentions-on-Student-Achievement.pdf>.  
*This report explains the connection between formative assessment and learning intentions, then summarizes the*

research about what makes learning intentions effective and the impact of learning intentions on student learning as well as students' ability to self-assess, though much of the research cited was carried out with older students.

6. General Teaching Council for England. (2011, March 11). *Research for Teachers: Hattie's Concept of Visible Teaching and Learning*. General Teaching Council for England.  
Retrieved from <http://www.curee.co.uk/files/publication/1301578655/Hatties%20concept%20of%20visible%20teaching%20and%20learning.pdf>.  
*This report summarizes the key findings in John Hattie's study: Visible learning: A synthesis of over 800 meta-analyses related to achievement, Routledge, London (2009) and discusses how and why clearly stated learning objectives are part of Hattie's definition of visible learning.*

## Videos

1. EL Education. Using a Learning Target Throughout a Lesson.  
Retrieved from <https://eleducation.org/resources/using-a-learning-target-throughout-a-lesson>
2. EL Education. Students Discuss the Power of Learning Targets.  
Retrieved from <https://eleducation.org/resources/students-discuss-the-power-of-learning-targets>
3. EL Education. Students Unpack a Learning Target. Retrieved from <https://eleducation.org/resources/students-unpack-a-learning-target>
4. EL Education. Students Unpack a Learning Target and Discuss Academic Vocabulary. Retrieved from <https://eleducation.org/resources/students-unpack-a-learning-target-and-discuss-academic-vocabulary>
5. EL Education. Student Own Their Progress: Using Data with Students. Culture of Growth: Growth in Students. Retrieved from <https://eleducation.org/resources/culture-of-growth-growth-in-students>
6. Teaching Channel. Adapting Socratic Seminar: Senior Project Reflection. Retrieved from <https://www.teachingchannel.org/videos/senior-project-reflection-socratic-seminar-ousd>

### Varied Content, Materials, and Methods of Instruction: Evidence and Resources

**3. Varied Content, Materials, and Methods of Instruction:** Students explore ideas and information in varied ways and access learning through multiple entry points. Teachers select content and materials to engage and meet the needs of all learners.

#### Supporting Beliefs

- Selected content must foster and reflect an understanding of multiple perspectives, critical issues, and the diversity of our world.
- Learners must see themselves represented in the materials and connect to the content in authentic ways to become fully engaged.
- Different entry points, options for exploration, and end products are critical for student engagement and success.

#### Key Traits

Content	Process	Assessment
<ul style="list-style-type: none"> <li>• Instructional materials and activities reflect the identities of learners in the community and the diversity of our world.</li> <li>• Content is selected and explored in ways that foster and reflect an understanding of multiple perspectives and critical issues.</li> <li>• Teachers select materials for instructional activities to meet the needs of a variety of learners.</li> <li>• Students have choice in materials and topics in order to meet learning outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>• Students make meaningful choices about their learning and are taught how to make those choices well.</li> <li>• Students learn new information in different ways—inquiry, investigation, presentation, etc.</li> <li>• Student groupings are flexible, varied and intentionally matched to the activity and learner.</li> <li>• Students use a range of methods (differentiated homework, reading, activities) and supports (including technology) to advance their learning.</li> <li>• Time and structures support reteaching and extension of learning, as needed.</li> <li>• Resources and materials improve accessibility for a variety of learners.</li> </ul>	<ul style="list-style-type: none"> <li>• Students have choices about how they demonstrate their learning.</li> <li>• Students use multiple and varied pathways to reach common ends.</li> <li>• Students use varied tools and supports (including technology) to demonstrate learning.</li> <li>• Assessments are relevant, authentic, and purposeful.</li> </ul>

#### Literature Supporting the Element

1. “Of all elements of an instructional plan, the most critical is the design of instructional activities. The important question to be answered is this: ‘What could students *do* in order to learn X?’ There are many choices, of course. They could listen to a presentation or they could work--either alone or in groups--to solve a problem or to engage in a project. They could participate in a class discussion or reflect in a journal on new information. The list is endless, and

skilled teachers draw on an extensive repertoire in making their decisions. Given the importance of students' active intellectual engagement in learning, skilled teachers, in their design of activities, favor those that challenge students to be cognitively active, that offer students the opportunity to select an activity from among several options, and that permit students the opportunity to develop their own understanding."

—Danielson, C. (2007). *Enhancing Professional Practice: A Framework for Teaching* (2nd ed.) (p. 57). Alexandria, VA: Association for Supervision and Curriculum Development.

2. "A 2008 meta-analysis of 41 studies found a strong link between giving students choices and their intrinsic motivation for doing a task, their overall performance on the task, and their willingness to accept challenging tasks (Patall, Cooper, & Robinson, 2008)."  
—Goodwin, B. (2010, September). "Research Says...Choice is a Matter of Degree." *Giving Students Meaningful Work* 68(1), 68.
3. "When teachers can present tasks in ways that make success seem attainable, and when they provide students with the support and tools to be successful, students are more likely to engage and persist in those tasks (Dweck, Walton, & Cohen, 2011)."  
—Farrington, C.A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T.S., Johnson, D.W., & Beechum, N. (2012). *Teaching Adolescents to Become Learners. The Role of Noncognitive Factors in Shaping School Performance: A Critical Literature Review* (p. 26). Chicago: University of Chicago Consortium on Chicago School Research.
4. "One aspect of previous knowledge that is extremely important for understanding learning is cultural practices that support learners' prior knowledge. Effective teaching supports positive transfer by actively identifying the relevant knowledge and strengths that students bring to a learning situation and building on them. Transfer from school to everyday environments is the ultimate purpose of school-based learning. An analysis of everyday environments provides opportunities to rethink school practices in order to bring them into alignment with the requirements of everyday environments. But it is important to avoid instruction that is overly dependent on context. Helping learners choose, adapt, and invent tools for solving problems is one way to facilitate transfer while also encouraging flexibility."  
—Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.). (2000). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy of Sciences.
5. "A teacher who is differentiating understands a student's needs to express humor, or work with a group, or have additional teaching on a particular skill, or delve more deeply into a particular topic, or have guided help with a reading passage—and the teacher responds actively and positively to that need. Differentiation is simply attending to the learning needs of a particular student or small group of students rather than the more typical pattern of teaching the class as though all individuals in it were basically alike."  
—Tomlinson, C., & Allan, S. (2000). *Leadership for Differentiating Schools and Classrooms*. Alexandria, VA: Association for Supervision and Curriculum Development.
6. "Studies have shown that 'contracts' can have positive effects on students' ability to set objectives for their learning (Brophy, 2004; Greenwood, 2002; Kahle & Kelly, 1994; Miller & Kelley, 1994; Tomlinson, 2001). These contracts provide students with control over their learning and provide opportunities for teachers to differentiate instruction to better accommodate students' learning needs (Tomlinson, 1995)... [C]ontracts can include teacher-identified or student-identified learning objectives. They can take the form of a learning plan that provides options for the kinds of activities students do on particular days and at specific times. In addition, they also provide students with guidance about what they need to accomplish, help students organize their time, and provide ongoing opportunities for students to seek or provide their own feedback."  
—Dean, C.B., Hubbell, E.R., Pitler, H., & Stone, B. (2012). *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.
7. "The most important thing is to focus on keeping students academically engaged so that they are invested as learners. Generally, this requires teachers to utilize strategies that are more interactive and more hands on. Most students learn better by doing than by sitting and listening passively. Teachers who employ strategies that challenge students to think and use their problem-solving abilities will be more successful in creating a learning environment that pushes kids to excel. We must challenge kids and give them the opportunity to see how what they learn in school can be applied in the real world. Cultural relevance is a really important part of this so it is imperative that we utilize multicultural books and learning materials that will engage kids and motivate them to apply themselves."  
—Rea, D. W. (2015). Interview with Pedro Noguera: How to Help Students and Schools in Poverty. *National Youth-At-Risk Journal* 1(1), 11-21.

8. “Culturally relevant teachers understand that learning is facilitated when we capitalize on learners’ prior knowledge. Rather than seeing students’ culture as an impediment to learning, it becomes the vehicle through which they can acquire the official knowledge and skills of the school curriculum. However, to capitalize on students’ cultures, teachers have to know students’ cultures.”  
—Ladson-Billings, G. (2001). *Crossing Over to Canaan: The Journey of New Teachers in Diverse Classrooms*. San Francisco, CA: Jossey-Bass Inc.
9. “It is important to keep in mind that construction of knowledge is not the same as physical involvement with manipulative materials. So-called hands-on learning may or may not be constructivist. Students can follow directions as mindlessly when using physical objects as they can when completing a worksheet. In a constructivist approach, students are cognitively engaged in what they are doing; the activities in other words, must be ‘minds-on.’ Although in many situations physical involvement with real objects aids this process, physical involvement provides no guarantee that students will be mentally engaged.”  
—Danielson, C. (2007). *Enhancing Professional Practice: A Framework for Teaching* (2nd ed.) (p. 17). Alexandria, VA: Association for Supervision and Curriculum Development.
10. “Effective education requires the fusion of skill and will such that intrinsic interest and motivation are given at least as much attention as cognitive outcomes (Crooks, 1988). Research suggests that when students share in the assessment process, they perceive more control of, and more responsibility for, their own learning (Rieg, 2007). Allowing students to help determine the criteria by which their work is judged gives them a feeling of empowerment and makes evaluation of their work seem less punitive and more constructive (Brookhart, 1997; Rieg, 2007). In turn, the positive effects on self-efficacy and motivation are likely to promote learning and achievement. Consistent with this notion, Haydel & Roeser (2002) found that students who believe they can affect their learning through persistently engaging in the educational process score better on standardized tests.”  
—Clark, Tedra, Englert, K., Frazee, D., Shebby, S., & Randel, B. *Stupski Foundation’s Learning System: Assessment*. Mid-continent Research for Learning. Denver, CO: McREL. Retrieved from <https://files.eric.ed.gov/fulltext/ED544626.pdf>.

## Resources and Readings

### Brief Articles

1. Armstrong, T. (2017, April). Neurodiversity: The Future of Special Education. *Differences, Not Disabilities* 74(7), 10-16. *This article explains the concept of neurodiversity as a way to recognize and honor neurological differences rather than seeing them as deficits. The author argues that field of special education has much to learn from the neurodiversity movement and that special education should shift practices to better reflect the concepts behind neurodiversity.*
2. Gonzalez, J. (2014, November 19). A Starter Kit for Differentiated Instruction. *Cult of Pedagogy*. Retrieved from <https://www.cultofpedagogy.com/starter-kit-differentiated-instruction>. *This article includes links to a collection of high-quality resources for learning how to differentiate including videos from The Teaching Channel and Edutopia. Resources are focused on application to a classroom setting.*
3. Powell, W., & Kusuma-Powell, O. (2012, February). Planning for Personalization. *For Each to Excel* 69(5), 52-55. *The article explores the connection between standards-based education and personalized learning with a focus on meeting learners where they are and using rich concepts as the base of teaching and learning.*
4. Stephens, C. (2015, September 15). Levels of Understanding: Learning That Fits All. *Edutopia*. <https://www.edutopia.org/blog/levels-of-understanding-learning-fits-all-charity-stephens>. *This short article describes how to “tier for levels of understanding” using depth of knowledge to describe levels and sharing those descriptions with students. The article includes links to other useful resources.*
5. Tomlinson, C., & Javius, E.L. (2012, February). Teach up for Excellence. *For Each to Excel* 69(5), 28-33. *In this article Tomlinson and Javius explore the way that sorting students into different tracks within a school correlates strongly with student race and economic status and predicts and contributes to student outcomes. They outline strategies for creating classrooms that support equity of access to excellence.*
6. Will, M. (2017, May 24). What happens when students design their own assessments? *Education Week*. Retrieved from <http://www.edweek.org/ew/articles/2017/05/24/what-happens-when-students-design-their-own.html>. *This article details the efforts of the Roanoke Virginia County district to move toward student-led assessments. It includes the voices and perspectives of students, teachers and administrators.*
7. Edutopia. (2016, September 12). Differentiated Instruction: Resource Roundup. *Edutopia*. Retrieved from <https://>

www.edutopia.org/article/differentiated-instruction-resources.

*This article includes links to many helpful resources related to differentiated learning including resources that focus on use of technology, project-based learning and examples from schools.*

## Books and Reports

1. Ballenger, C. (2009). *Puzzling Moments, Teachable Moments: Practicing Teacher Research in Urban Classrooms*. New York, NY: Teachers College Press.  
*In this book, Ballenger highlights the intellectual strengths of poor, urban, immigrant, or bilingual children. She challenges long-held notions about these groups of children and offers ideas for how teachers might change their thinking and practices in the classroom.*
2. American Institutes for Research. (2016). *Study of Deeper Learning: Opportunities and Outcomes*. American Institutes for Research. Retrieved from <http://www.air.org/project/study-deeper-learning-opportunities-and-outcomes>.  
*This report examines how some schools have provided opportunities for students to acquire deeper learning skills and how these opportunities are related to student outcomes.*
3. Center for Opportunity Policy in Education, Stanford University. (2014). *Student Centered Schools: Closing the Opportunity Gap*. Stanford, CA: SCOPE. <https://edpolicy.stanford.edu/sites/default/files/scope-pub-student-centered-research-brief.pdf>  
*This report reviews the practices and outcomes of four urban high schools. It reviews the student-centered approaches being implemented in those schools as well and the student outcomes achieved.*
4. Gandara, P. *Deeper Learning Research Series: The Implications of Deeper Learning for Adolescent Immigrants and English Language Learners*. (2015, November). Students at the Center: Jobs for the Future. Retrieved from <http://www.jff.org/sites/default/files/publications/materials/The-Implications-of-DL-for-Adolescent%20Immigrants-and-ELLs-110415a.pdf>.  
*In this this report Gandara argues that while English language learners are likely to receive great benefits from an education based in the principles of Deeper Learning, they are often overlooked as deficient students in need of remediation. She details the barriers many such student face and suggests ways to reframe how we look at ELL and immigrant student populations in relation to deeper learning.*
5. Gay, G. (2010). *Culturally Responsive Teaching: Theory, Research, and Practice*. New York, NY: Teachers College Press.  
*Combining insights from multicultural education theory and research with real-life classroom stories, Gay demonstrates that all students will perform better on multiple measures of achievement when teaching is filtered through their own cultural experiences.*
6. Thomas B. Fordham Institute. (2017). *What Teens Want From Their Schools: A National Survey of High School Student Engagement*. Washington, DC: Crux Research.  
*This national survey of students uncovers students' feelings about school and what motivates and engages them to learn.*
7. Kallick, B., & Zmuda, A. (2017). *Students at the Center: Personalized Learning with the Habits of Mind*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*This book explores and explains a model of personalized learning that focuses on helping students develop and apply habits of mind. It includes practical suggestions and examples for application.*
8. Martinez, M., and McGrath, D. (2014). *Deeper Learning: How Eight Innovative Public Schools are Transforming Education in the Twenty-First Century*. New York, NY: New Press.  
*In this book, Martinez and McGrath detail the work of eight innovative public schools. They explore the role of innovation and highlight the real work of students and teachers in these schools.*
9. Tomlinson, C. (2014). *The Differentiated Classroom: Responding to the Needs of All Learners* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.  
*This book includes a balance of theory behind differentiated instruction and instructional strategies that can be implemented in the classroom. It includes examples of how teachers are differentiating classrooms across grade levels and content areas.*

## Videos

1. Edutopia. Project Based Learning: Success Start to Finish.  
Retrieved from <https://www.youtube.com/watch?v=-OWX6KZQDoE>
2. Teaching Channel. Daily Assessment with Tiered Exit Cards.  
Retrieved from <https://www.teachingchannel.org/videos/student-daily-assessment>
3. Teaching Channel. Learning Menus: Giving Options and Independence.  
Retrieved from <https://www.teachingchannel.org/videos/independence-in-learning>
4. Teaching Channel. Making Learning Personalized and Customized.  
Retrieved from <https://www.teachingchannel.org/videos/workshop-model-customized-learning>
5. EL Education. The Four Ts. Retrieved from <https://eleducation.org/resources/the-four-ts>
6. EL Education. Matching Module Lessons to Learner's Needs.  
Retrieved from <https://eleducation.org/resources/matching-module-lessons-to-learners-needs>

### Practice and Feedback: Evidence and Resources

**4. Practice and Feedback:** Students have opportunities to practice what they are learning and given timely, specific feedback based on their current performance in relation to the desired outcomes.

#### Supporting Beliefs

- Learning is a cycle that includes goal-setting, successes, multiple attempts, and course corrections.
- Productive practice and novel application of skills are essential for learning.
- Timely, specific, and varied feedback is a catalyst for growth.

#### Key Traits

Practice	Feedback
<ul style="list-style-type: none"> <li>• Routines, strategies, and instruction support student learning of essential skills and knowledge by providing opportunities for practice.</li> <li>• Opportunities for practice allow students to work independently, cooperatively, and with teacher guidance</li> <li>• Students practice applying complex skills over time within and across disciplines.</li> </ul>	<ul style="list-style-type: none"> <li>• Teachers give students feedback that is timely, specific, and actionable.</li> <li>• Students are taught how to give, interpret, and use feedback in their learning.</li> <li>• Students have opportunities to give, receive, and use feedback to revise essential pieces of work.</li> </ul>

### Literature Supporting the Element

1. “We would argue that the things you do well were taught to you through a series of intentional actions. You probably did not develop high levels of skills from simply being told how to complete tasks. Instead, you likely had models, feedback, peer support, and lots of practice. Over time, you developed your expertise. You many even have learned more when you had to share that expertise with others.”  
—Fisher, D., & Frey, N. (2014). *Better Learning Through Structured Teaching: a Framework for the Gradual Release of Responsibility* (p. 2). Alexandria, VA: Association for Supervision and Curriculum Development.
2. “[...]teachers take time to guide students through practice activities. As they guide, teachers help make sure students attend to the proper issues and understand the rationale for their actions.....the teacher was not satisfied to hear students offer the correct answer. She wanted to hear students explain why each step made sense.”  
—Johnson, J., Uline, C., and Perez, L. (2013). *Teaching Practices from America’s Best Urban Schools: A Guide for School and Classroom Leaders* (1st ed.) (p. 77). New York, NY: Routledge.
3. “Feedback isn’t ‘feedback’ unless it can truly feed something. Information delivered too late to be used isn’t helpful. Make sure when you give feedback that there is time built in to actually use the information. Otherwise students will quickly learn to ignore feedback.”  
—Brookhart, S. M. (2017). *How to Give Effective Feedback to Your Students* (2nd ed.) (p. 57). Alexandria, VA: Association for Supervision and Curriculum Development.

4. “Too often, assessments are used to provide snapshots of learning rather than providing information that can be used by students or their teachers to address the three feedback questions. Certainly, a critical conclusion is that teachers need to seek and learn from feedback (such as from students’ responses to tests) as much as do students, and only when assessment provides such learning is it of value to either.”  
—Hattie, J., and Timperley, H. (2007, March). The Power of Feedback. *Review of Educational Research* 77(1), 102-104.
5. “...[W]hen giving feedback to students about their work, we cannot be afraid to be critical. We don’t have to tell them they are doing great to encourage them. Often, we don’t have to evaluate their work at all....As an alternative, being solely descriptive about what we see is often the only feedback students need to go back to their desk and make their work better....That student needs to see where the work meets expectations and where it needs to go next if it is to be better.”  
—Toshalis, E. (2015). *Make Me!: Understanding and Engaging Student Resistance in School* (p. 102). Cambridge, MA: Harvard Education Press.
6. “Giving feedback to students on their progress toward a goal becomes irrelevant if the classroom is not structured to provide students additional opportunity to learn and improve their performance.”  
—Farrington, C.A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T.S., Johnson, D.W., & Beechum, N. (2012). *Teaching Adolescents to Become Learners. The Role of Noncognitive Factors in Shaping School Performance: A Critical Literature Review* (p. 37). Chicago, IL: University of Chicago Consortium on Chicago School Research.
7. “Independent practice (including homework) is designed to give students meaningful opportunities to practice concepts and skills they have learned. It should not be boring, meaningless repetition.”  
—Johnson, J.F. Jr., Perez, L., & Uline, C. (2003). *Teaching Practices from America’s Best Urban Schools: A Guide for School and Classroom Leaders* (p. 80). New York, NY: Routledge.
8. “... When feedback provides explicit guidance that helps students adjust their learning, there is a greater impact on achievement, students are more likely to take risks with their learning, and they are more likely to keep trying until they succeed (Brookhart, 2008; Hattie & Timperley, 2007; Shute, 2008).”  
—Dean, C. B., Hubbell, E.R., Pitler, H., & Stone, B. (2012). *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement* (2nd ed). Alexandria, VA: Association for Supervision and Curriculum Development.

## Resources and Readings

### Brief Articles

1. Chappuis, J. (2012). How Am I Doing? *Educational Leadership* 70(1), 36-41.  
*In this brief article, the author explains 3 pre-conditions for effective feedback and 5 traits of effective feedback, providing examples of several from practice.*
2. EL Education. Models, Critique, and Descriptive Feedback: Common Challenges. Retrieved from <https://eleducation.org/resources/models-critique-and-descriptive-feedback-common-challenges>.  
*This webpage provides descriptions of common challenges encountered when teachers move to using models, critiques and descriptive feedback as well as strategies to address them.*
3. Fisher, D., & Nancy, F. (2012). Making Time for Feedback. *Educational Leadership* 70(1), 42-46.  
*The authors outline and provide examples of 4 strategies that will reduce time spent on generating feedback to students and make the feedback teachers do provide more effective.*
4. Schwartz, K. (2017, April 12) Why Giving Effective Feedback is Trickier Than It Seems. Retrieved from <https://ww2.kqed.org/mindshift/2017/04/12/why-giving-effective-feedback-is-trickier-than-it-seems>.  
*In this blog post, the author recaps some foundational research about feedback before outlining some common traps and critical considerations around when, how and why to give feedback. The text includes reference to other texts and video sources as well.*
5. William, D. (2008). The Secret of Effective Feedback. *Educational Leadership* 73(7), 10-15.  
*In this piece, the author explains that for feedback to be effective, it must be used to improve performance. He outlines critical considerations related to the purpose of feedback, types of feedback, types of tasks, the environment, and self-reflection to help students use feedback.*

## Books and Reports

1. Brookhart, S.M. (2008). *How to Give Effective Feedback to Your Students*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*This book explains the research on feedback as well as different types of feedback and how to give feedback in varied ways. Additionally, there are chapters on helping students use feedback, content specific strategies and addressing learner differences.*
2. Fisher, D, & Frey, N. (2008). *Better Learning Through Structured Teaching: A Framework for the Gradual Release of Responsibility*. Alexandria, VA: Association for Supervision and Curriculum Development.  
*In this book, the author's describe the gradual release of responsibility that promotes the transfer of cognitive load from teacher to student, outlining four key phases: focus lessons, guided instruction, collaborative practice, and independent practice. The text identifies and explains various structures and strategies for each phase.*
3. Hattie, J., & Timperley, H. (2007, March). The Power of Feedback. *Review of Educational Research* 77(1), 81-112.  
*This article outlines some of the key research about feedback, including what about the type of feedback and how it is given makes the feedback more or less effective. The authors then propose a model of feedback that will promote a greater positive effect.*
4. Hanover Research. (2014). *The Impact of Formative Assessment and Learning Intentions on Student Achievement*. Washington, DC: Hanover Research. Retrieved from <http://www.hanoverresearch.com/media/The-Impact-of-Formative-Assessment-and-Learning-Intentions-on-Student-Achievement.pdf>.  
*This report explains the connection between formative assessment and learning intentions, then summarizes the research about what makes learning intentions effective and the impact of learning intentions on student learning as well as students' ability to self-assess, though much of the research cited was carried out with older students.*
5. Johnson, J. F. Jr., Perez, L., & Uline, C. (2013). *Teaching Practices from America's Best Urban Schools: A Guide for School and Classroom Leaders* (p. 80). New York, NY: Routledge.  
*This book profiles the patterns in practice among award winning urban schools that have a strong record of producing equitable results across all demographic groups. Chapter 7 in particular focuses on the role of practice and feedback.*

## Videos

1. EL Education. Critique and Feedback.  
Retrieved from <https://eleducation.org/resources/critique-and-feedback>
2. EL Education. Descriptive Feedback Helps All Students Reach Proficiency.  
Retrieved from <https://eleducation.org/resources/descriptive-feedback-helps-all-students-reach-proficiency>
3. EL Education. Praise, Question, Suggestion.  
Retrieved from <https://eleducation.org/resources/praise-question-suggestion>
4. EL Education. Reflection Circles.  
Retrieved from <https://eleducation.org/resources/debrief-circles>
5. Teaching Channel. Highlighting Mistakes.  
Retrieved from <https://www.teachingchannel.org/videos/math-test-grading-tips>

## Complex Thinking and Transfer: Evidence and Resources

**5. Complex Thinking and Transfer:** Students are coached and taught to engage in higher order thinking through instructional activities and practice tasks. Curriculum, instruction and assessments are designed to prompt complex thinking, integration of concepts and ideas, and application of learned skills to new material or novel situations.

### Supporting Beliefs

- Every student is capable of complex thought and transfer of learning.
- Higher order thinking promotes student engagement.
- Learning that promotes transfer of knowledge and skills prepares students for the future.

### Key Traits

- Students engage in complex thinking throughout all stages of learning—from the introduction of new material to the application of what has been learned.
- Students ask and are asked questions that help them access and integrate knowledge to analyze, evaluate, and draw conclusions.
- Students are taught how to integrate and apply what they have learned within and across content areas and are given opportunities to practice.
- Students wrestle with complex and authentic problems.

## Literature Supporting the Element

1. “[H]igher-order thinking happens when students engage with what they know in such a way as to transform it. That is, this kind of thinking doesn’t just reproduce the same knowledge; it results in something new.... Higher-order thinking only makes sense if to truly ‘know’ something means that you can use it and transform it.”  
—Brookhart, S.M. (2014). *How to Design Questions and Tasks to Assess Student Thinking* (pp. 2-3). Alexandria, VA: Association for Supervision and Curriculum Development.
2. “Liberating education consists in acts of cognition, not transferrals of information.”  
—Freire, P. (2000). *The Pedagogy of the Oppressed* (30th ed.) ( p. 79). New York, NY: Continuum.
3. “Schools that engage low-income and minority students in deeper learning have stronger academic outcomes, better attendance and student behavior, lower dropout rates, higher graduation rates, and higher rates of college attendance and perseverance than comparison schools serving similar students.”  
—Noguera, P., Darling-Hammond, L., Friedlaender, D. (2015, October). Equal Opportunity for Deeper Learning, Executive Summary (p. 2). *Deeper Learning Research Series*. Retrieved from <http://www.jff.org/sites/default/files/publications/materials/Equal-Opportunity-for-Deeper-Learning-Executive-Summary-092315.pdf>
4. “Almost all of our teachers at Booker T. Washington were black women. They were committed to nurturing intellect so that we could become scholars, thinkers, and cultural workers—black folks who used our ‘minds.’ We learned early that our devotion to learning to a life of the mind, was a counter-hegemonic act, a fundamental way to resist every strategy of white racists colonization. Though they did not define or articulate these practices in theoretical terms, my teachers were enacting a revolutionary pedagogy of resistance that was profoundly anti-colonial.”  
—Hooks, B. (1994). *Teaching to Transgress: Education as the Practice of Freedom* (p. 2). New York, NY: Routledge.

5. "It may seem counterintuitive to endeavor to inspire confusion, refusal and resistance in the learner, but cognitive developmental psychology and neuroscience have shown that authentic, complex, deep, and long-lasting learning seldom occurs without struggle. This is because cognitive dissonance forces a decision in the mind of the learner: 'Do I accept the new knowledge or work to reject it? And if I accept it, what needs to change in the way I think about things?' The learner's challenge of integrating the knowledge that comes in with the knowledge already possessed forces the brain to make comparisons, weigh perspectives, consider options, evaluate plausibility, and judge merits. When the learner is compelled to make these sorts of determinations, the process activates and strengthens the most complex parts of the brain."  
—Toshalis, E. (2015). *Make Me!: Understanding and Engaging Student Resistance in School* (p. 67). Cambridge, MA: Harvard Education Press.
6. "Newmann et al (1996) have presented three significant findings in relation to raising levels of academic achievement and intellectual quality: first, that students from all backgrounds are more engaged when classroom work is cognitively challenging than when it consists solely of conventional low-level work; second, that all students, regardless of social or ethnic background, achieve at higher levels when they participate in an intellectually challenging curriculum; and third, that equity gaps diminish as a result of engagement in such curricula."  
—Gibbons, P. (2009). *English Learners, Academic Literacy, and Thinking: Learning in the Challenge Zone* (pp. 3-4). Portsmouth, NH: Heinemann.
7. "Experimental psychologists in the last half-century have been fascinated with motivation as a prerequisite for learning. They have discovered that when we come in contact with ambiguous, complex or conflicting information, our nervous systems become aroused, amping us up and forcing us to pay attention. When we are puzzled, we find a resolution very rewarding, which sets us up for efficient learning (Berlyne, 1966; Lowenstein, 1994)."  
—Ostroff, W. L. (2016). *Cultivating Curiosity in K-12 Classrooms: How to Promote and Sustain Deep Learning* (p. 12). Alexandria, VA: Association for Supervision and Curriculum Development.
8. "Assess higher-order thinking during all parts of instruction and assessment, both formative and summative. You can use higher-order thinking questions in many instances--oral class discussions, quizzes, exit tickets, and other classroom strategies, and tests. You can use higher-order thinking tasks in many instances as well--classroom learning activities, performance assessments, and short- and long-term projects. The most important point here is that higher-order thinking and questions and tasks should be infused throughout instruction and assessment. Don't wait until students have memorized some facts and then ask them to reason with the facts as a second step."  
—Brookhart, Susan M. (2014) *How to Design Questions and Tasks to Assess Student Thinking* (p. 4). Alexandria, VA: Association for Supervision and Curriculum Development.
9. "Transfer doesn't just happen as a result of a typical regimen of teaching and testing, no matter how rigorous the course of study. Transfer happens only when we aggressively teach and test for understandings that are applied in situations. As the authors of *How People Learn* put it: A key finding in the learning and transfer literature is that organizing information into a conceptual framework allows for greater "transfer"; that is, it allows the student to apply what was learned in new situations and to learn related information more quickly.... Transfer is affected by the degree to which people learn with understanding rather than merely memorize sets of facts or follow a fixed set of procedures; the research also shows clearly that "usable knowledge" is not the same as a mere list of disconnected facts."  
—Wiggins, G. (2010, March 27). What is the Transfer? *Big Ideas: An Authentic Education E-Journal*. Retrieved from [http://www.authenticeducation.org/ae\\_bigideas/article.lasso?artid=60](http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60)
10. "Activities and assignments that promote learning tend to share certain characteristics: (1) they emphasize thinking and problem-based learning; (2) they permit student choice and initiative; and (3) they encourage depth rather than breadth."  
—Danielson, C. (2007) *Enhancing Professional Practice: A Framework for Teaching* (2nd ed.) (p. 58). Alexandria, VA: Association for Supervision and Curriculum Development.
11. "High schools must respect adolescents more and patronize them less. The best respect is high expectations for them, and a level of accountability more adult in its demand than childlike. We should expect them to learn more while being taught less. Their personal engagement with their own learning is crucial; adults cannot 'give' them an education."  
—Sizer, T. R. (2004). *Horace's Compromise: The Dilemma of the American High School* (p. 34). Boston, MA: Houghton Mifflin.
12. "I wanted to become a critical thinker. Yet that longing was often seen as a threat to authority."  
—Hooks, B. (1994). *Teaching to Transgress: Education as the Practice of Freedom* (p. 5). New York, NY: Routledge.

## Resources and Readings

### Brief Articles

1. Brookhart, S. M. (2016). Start with Higher-Order Thinking. *Powerful Lesson Planning*, 74(2), 10-15.  
*This article outlines three strategies for incorporating higher order thinking (Open Questions, Thinking, Not Retelling, and Student Self-Assessment) into daily lessons, including examples of each strategy in use.*
2. MindShift. (2016, August 10). The Role of Metacognition in Learning and Achievement. *KQED News*. Retrieved from <https://www.kqed.org/mindshift/2016/08/10/the-role-of-metacognition-in-learning-and-achievement>.  
*This post contains an excerpt from "Four Dimensional Education: The Competencies Learners Need to Succeed" and describes the critical role of metacognition in transfer of knowledge, outlining several strategies to help students develop their metacognitive skills.*
3. Newmann, F. M., and Wehlage, G. G. (1993). Five Standards of Authentic Instruction. *Educational Leadership*, 50(7), 8-12.  
*This article explains five elements of authentic instruction (Higher-Order Thinking, Depth of Knowledge, Connectedness to the World Beyond the Classroom, Substantive Conversation, and Social Support for Student Achievement) and explains how they can be used together to impact classroom instruction.*
4. Schwartz, K. (2017, June 14). How Do You Know When a Teaching Strategy is Most Effective? John Hattie has an Idea. *KQED News*. Retrieved from <https://www.kqed.org/mindshift/2017/06/14/how-do-you-know-when-a-teaching-strategy-is-most-effective-john-hattie-has-an-idea>.  
*In this brief article, the author described a learning model developed by Hattie and Donoghue that accounts for skills and knowledge, learning dispositions and motivation as well as defines what strategies are most successful for learning at surface and deep levels.*
5. Wiggins, G. (2010, March 27) What is the Transfer? *Big Ideas: An Authentic Education E-Journal*. Retrieved from [http://www.authenticeducation.org/ae\\_bigideas/article.lasso?artid=60](http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60).  
*This piece defines transfer, discusses the challenges related to transfer of knowledge and outlines several strategies for use in the classroom that promote the transfer and application of knowledge.*

### Books and Reports

1. Bransford, J. D., Brown, A.L., & Cocking, R.R. (Eds). (2000). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy of Sciences.  
*This text explains the research and brain science related to learning including how we learn, what makes experts different from novices, and how to promote transfer as well as the implications for classroom and instructional design.*
2. Brookhart, S. M. (2014). *How to Design Questions and Tasks to Assess Student Thinking*. Alexandria, VA: Association for Supervision & Curriculum Development.  
*This book outlines principles of assessing higher-order thinking and provides examples of how to incorporate higher-order thinking in a variety of assessment tasks including multiple choice questions, open-ended questions, and performance tasks.*
3. American Institutes for Research. (2014). *Does Deeper Learning Improve Student Outcomes? Results from the Study of Deeper Learning: Opportunities and Outcomes*. Retrieved from <https://www.air.org/sites/default/files/Deeper-Learning-Summary-Updated-August-2016.pdf>.  
*The study examines the relationship between deeper learning and student outcomes. The study includes strategies to develop three types of deeper learning competencies: cognitive (mastery of core content, critical thinking skills), interpersonal (collaboration skills, communication skills), and intrapersonal (learning-how-to-learn skills, academic mindsets).*
4. McTighe, J., & Wiggins, G. (2013). *Essential Questions: Opening Doors to Student Understanding*. Alexandria, VA: Association for Supervision & Curriculum Development.  
*This book explains the qualities of essential questions and outlines ways to create and use them to cultivate an environment of inquiry in the classroom and beyond. It is a useful companion to Understanding by Design or can be used on it's own.*
5. Ostroff, W. L. (2016). *Cultivating Curiosity in K-12 Classrooms: How to Promote and Sustain Deep Learning*. Alexandria, VA: Association for Supervision & Curriculum Development.  
*This book examines the role of curiosity in the classroom based on the science of learning and outlines ways to foster curiosity through the use of exploration and experimentation to create autonomous, reflective learners.*

6. Deans for Impact. (2015). *The Science of Learning*. Austin, TX: Deans for Impact. Retrieved from [https://deansforimpact.org/wp-content/uploads/2016/12/The\\_Science\\_of\\_Learning.pdf](https://deansforimpact.org/wp-content/uploads/2016/12/The_Science_of_Learning.pdf).  
*This report summarizes existing research in cognitive science including how students learn new material, solve problems, and apply and transfer learning. Furthermore, this report addresses questions of motivation to learn and offers practical suggestions and implications for classrooms and teachers.*

## Videos

1. Teaching Channel. Deeper Learning Series.  
Retrieved from <https://www.teachingchannel.org/deeper-learning-video-series>
2. Teaching Channel. Higher Order Questions: A Path to Deeper Learning.  
Retrieved from <https://www.teachingchannel.org/videos/teaching-higher-order-thinking-skills>
3. Teaching Channel. Deepening Text Analysis Through Student Talk.  
Retrieved from <https://www.teachingchannel.org/videos/text-analysis-lesson-ousd>
4. Teaching Channel. Engaging Students in Work that Matters.  
Retrieved from <https://www.teachingchannel.org/videos/engage-students-meaningful-work-hth>
5. Teaching Channel. Challenge at the Heart of Deeper Learning.  
Retrieved from <https://www.teachingchannel.org/videos/deeper-learning-challenges-students-exl>