Linking Secondary and Postsecondary Systems- Lessons from Indiana
American Youth Policy Forum (2009). Washington, D.C.
http://www.aypf.org/documents/FINALLinkingSecondary-PostsecondaryIssueBrief-FINAL.pdf
The American Youth Policy Forum hosted an event in Indianapolis, Indiana in 2009 focused on effective linking between secondary and postsecondary systems. The trip highlighted Indiana as a strong example of a state that has enlisted multiple strategies to increase the number of college- and career-ready students and ensure that once students finish high school they excel in postsecondary colleges and careers. The issue brief emphasizes Indiana's use of cross-system collaboration with higher education, innovative teacher preparation programs and effort to develop a data system linking K-12, higher education and the labor market as the vital pieces of its system.

Preparing High School Students for Successful Transitions to Postsecondary Education and Employment
Bangser, M. (August 2008). Washington, D.C.: National High School Center.
http://www.betterhighschools.org/docs/PreparingHSStudentsforTransition_073108.pdf
This issue brief discusses the lack of preparation that high school students often face as they make the transition to postsecondary institutions and careers. It review findings from previous studies targeted toward addressing the problem of under preparation, and offers key takeaways for policymakers at the state level, as well as administrators at the district and school level. The brief discusses several promising practices for ensuring that students are prepared for postsecondary institutions and careers, but cautions that practices must be accompanied by financial investment, technical assistance and strong professional development.

On Ramp to College: A State Policymaker's Guide to Dual Enrollment
Hoffman, N., Santos, J. & Vargas, J. (May 2008). Jobs for the Future.
http://www.jff.org/sites/default/files/OnRamp.pdf
Dual enrollment is no longer just for gifted and talented high school students hoping to get a head start on college, according to a report by Jobs for the Future. The report reviews trends in a growing number of states that see dual enrollment as a way to expand college opportunity – particularly for students who might not traditionally be considered "college bound." It highlights examples of successful statewide dual enrollment efforts and provides a step-by-step plan for policymakers to create successful programs and policies.

College Readiness and High School-To-College Success
Conley, D. (2008). Eugene, OR: Educational Policy Improvement Center.
http://www.epiconline.org/files/pdf/Aspen%20Institute.pdf
This research brief from the Educational Policy Improvement Center discusses the challenges and limitations high schools face in preparing all students for postsecondary success. The brief offers policy options for governments to consider when improving alignment between secondary and postsecondary institutions. Suggestions offered in the brief include incentives for aligning K-12 and higher education and examining the effectiveness of dual enrollment, early admission and dual credit programs in the state.

Findings from the Early College High School Initiative: A Look at Best Practices and Lessons Learned Regarding a Dual Enrollment Program
National High School Center (2007). Washington, D.C.
http://www.betterhighschools.org/pubs/documents/NHSC_EarlyCollegeHighSchool_032107.pdf
This policy brief looks at the Early College High School Initiative, including early lessons learned and evidence of best practices. Early college enrollment programs are being developed to introduce students, especially those traditionally underserved in higher education, to more rigorous coursework, and to better prepare them

for postsecondary success. The brief suggests establishing student participations goals and focusing on program structure and financing to guarantee the success of these programs.

K-12 AND WORKFORCE ALIGNMENT

Education and Workforce Data Connections: A Primer on States' Status
Data Quality Campaign (2010). Washington, D.C.
http://www.dataqualitycampaign.org/files/Workforce_Data_Brief.pdf
This Data Quality Campaign brief focuses on the importance of robust longitudinal data systems that have the ability to not only track students who attend two-year and four-year institutions post high school, but can also accurately track students through the workforce. The inability in some data systems to accurately track those students who do not directly go to colleges produces an incomplete view of student success after high school. The brief produces data from an annual survey given to all 50 states, the District of Columbia, and Puerto Rico, to analyze the landscape of longitudinal data systems in the nation.

Revving the Education Engine: Effectively Aligning Education, Workforce and Economic Development Policy
Vandal, B. (2009) Denver, CO: Education Commission of the States.
http://www.ecs.org/docs/RevvingEdEngine.pdf
This brief offers strategies for aligning K-12 and postsecondary education, economic development, and workforce development policy. Its main intent is to give suggestions for a comprehensive alignment system, that is, not one that only targets students obtaining a traditional path after college, but also includes students who seek postsecondary career training, and individuals who have been in the workforce for years and now require additional education. Strategies for alignment are provided, and additional efforts vital for success, such as leadership engagement, are addressed.

RIGOROUS MATH COURSE-TAKING

The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes
Hanushek, A. & Woessmann, L. (2010). Paris, France: The Organisation for Economic Co-operation and Development (OECD). http://www.pisa.oecd.org/dataoecd/11/28/44417824.pdf
The OECD released a study that shows that improved performance on international math and science tests has a positive impact on a country's future Gross Domestic Product (GDP). Using data from twelve international tests (including PISA) dating back to 1964 to construct an index of cognitive skill levels for a large sample of countries, analysts employed scenarios to estimate the long-term effects of educational improvement, all of which are remarkable in their scope. Increasing the average scores on PISA by twenty-five points (a quarter of a standard deviation) over twenty years would result in an increase in the American GDP of $40 trillion over the lifetime of the generation born in 2010.

Math in American High Schools: The Delusion of Rigor
Schneider, M. (2009). Washington, D.C.: American Enterprise Institute. http://www.aei.org/outlook/100074
In this AEI Outlook Series, the growing concern over lack of rigorous high school math courses is addressed. Although students are seemingly taking more rigorous math courses, scores on the National Assessment of Educational Progress remain stagnant, proving that courses all too often are only rigorous in name only. The author argues that this is letting students across the nation down, and allowing American students to fall further behind their international peers in mathematics.

Mathematics Course-taking and Achievement at the End of High School: Evidence from the Education Longitudinal Study of 2002
Bozick, R., and Ingels, S.J. (2008). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. **http://nces.ed.gov/pubs2008/2008319.pdf**
This National Center for Education Statistics report examines the relationship between the mathematics courses students complete in 11th and 12th grade and learning gains made during those two years. Key findings underscore the need for students to take rigorous mathematics courses throughout high school in order to meet expectations for (and master the complex, multi-step problem solving necessary for success in) postsecondary education and the workplace.

Rethinking High School: Preparing All Students to be College Ready in Math
Corbett, G. & Huebner, T. (2008). Washington, D.C: WestEd.
http://www.wested.org/online_pubs/GF-08-01.pdf
This report acknowledges that there are great shortcomings in high school mathematics programs across the country that results in poor achievement scores on state and national tests, and contributes to the problem of underprepared students for college-level mathematics. It presents three key elements that exist in strong mathematics programs – offering high-level math courses and supports, continually improving teachers' skills and math content knowledge, and using student information to drive instruction – and shows what these elements look like in practice, by using specific high schools to highlight how these elements play out in real world settings.

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SCIENCE, TECHNOLOGY, ENGINEERING AND MATH (STEM)

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Strengthening STEM Education in the Early Years
Murray, J. (2010). Boston, MA: The Wheelock College Aspire Institute.
http://www.wbur.org/wp-content/uploads/2010/05/foundation-for-the-future-report-fnl.pdf
This report stresses the need for STEM education much earlier in the education pipeline. STEM education efforts have been focused primarily at the middle and high school level, but it is in the Pre-Kindergarten through 6th grade years that the focus must be directed to build the foundation and strengthen students' interest earlier. The report notes that attention must be turned to increasing the number and strengthening the skills of Pre-K – 6th grade teachers qualified to teach STEM subjects.

Science, Technology, Engineering & Math
 Jones, R. (2008). Glen Burnie, MD: State Educational Technology Directors Association (SETDA).
http://www.setda.org/c/document_library/get_file?folderId=270&name=DLFE-257.pdf
This paper offers a broad look at STEM education in the United States. It begins by describing STEM education's importance, focusing on the international competitiveness of the U.S., and provides explanations of the current STEM initiatives offered at the national, state and district levels. It closes by offering key recommendations for building robust STEM programs throughout the U.S.

Building a Science, Technology, Engineering and Math Agenda
Toulmin, C. & Groome, M. (2007) Washington, D.C.: National Governors Association.
http://www.nga.org/Files/pdf/0702INNOVATIONStem.pdf
This report looks at the major issues high school STEM programs face, and gives recommendations for improving STEM. They include: Aligning state K–12 STEM standards and assessments with postsecondary and workforce expectations, examining and increasing the state's capacity to implement a rigorous aligned STEM

education system statewide to improve teaching and learning, and supporting innovative models to find best practices in STEM education and bring them to scale.

Addressing the STEM Challenge by Expanding Specialty Math and Science High Schools
Atkinson, R. et al. (2007) **http://www.ncsssmst.org/CMFiles/Docs/STEM%20Final_03_20_07.pdf**
This paper discusses the shortage of scientists, technicians, engineers and mathematicians in the U.S., and offers as a solution the increase of specialty math and science high schools throughout the nation. These schools have more rigorous graduation requirements, in some cases requiring a mathematics-science major in addition to the three years of mathematics and science students must take. The paper gives policy recommendations for increasing these schools throughout the country.

A Commitment to America's Future: Responding to the Crisis in Mathematics & Science Education
Business-Higher Education Forum (2005). Washington, D.C.
http://www.bhef.com/publications/documents/commitment_future_05.pdf
This paper by the Business-Higher Education Forum calls for collaboration between the business community, higher education, policy leaders, and P-12 education leaders, to tackle the issue of strong mathematics and science education in the United States. It offers a four-part action agenda to help guide these groups (especially the business and higher education educators who may not be as familiar with these issues). The four key action agenda are: establish a P-16 education council in each state, simultaneously address and align the various P-12 system components, engage business and higher education in more effective P-12 reform roles, and implement coordinated national and state public information programs.

Tapping America's Potential: The Education for Innovation Initiative
The Business Roundtable (2005). Washington, D.C.
www.sbcalliance.org/uploads/TappingAmericasPotential.pdf
 Fifteen businesses joined together in 2005 because of concerns that America's international competitiveness in science and technology was slipping. Together they formed the goal of doubling the number of science, technology, engineering and mathematics graduates with bachelor's degrees by 2015. The paper "Tapping America's Potential: The Education for Innovation Initiative" provides recommendations the group believes will help the U.S. meet this ambitious goal.

CAREER AND TECHNICAL EDUCATION (CTE)

What is "Career Ready?"
Association for Career and Technical Education (2010).
www.acteonline.org/uploadedFiles/Publications_and_Online_Media/files/Career_Readiness_Paper.pdf
In this paper, the Association for Career and Technical Education offers a definition of career ready and explains how it differs from college ready. They explain that specific skills are needed by student going straight into careers post high school, and often these skills are not addressed in traditional classrooms. The paper stresses that students preparing for college and students preparing for a career need the same foundational academic knowledge, though students going straight into careers must also be able to apply this knowledge in context, and should graduate with job-specific technical skills as well.

Capitalizing on Context: Curriculum Integration in Career and Technical Education
NRCCTE Curriculum Integration Workgroup (2010). Louisville, KY.
http://136.165.122.102/UserFiles/File/Tech_Reports/NRCCTE_Curriculum_WEB_READY.pdf
 This report discusses the finding from two studies conducted by the National Research Center for Career and Technical Education. The Math-in-CTE study used two groups of volunteer teachers, and instructed one group

to use math-enhanced lessons, while the other group did not change their lessons at all. The study proved that the math-enhanced group of students did much better on exams while maintaining their occupational knowledge. The Authentic Literacy Applications-in-CTE pilot study was developed to "determine the impact of disciplinary literacy strategies on the reading comprehension, vocabulary development and motivation to read for students enrolled in CTE courses." The reading instruction improved both comprehension and vocabulary understanding, though it had no effect on motivation to read.

The Role of Career Academies in Education Improvement
Association for Career and Technical Education (2009). Alexandria, VA.
www.acteonline.org/uploadedFiles/Publications_and_Online_Media/files/Career_academies.pdf
This brief explores the benefits of career academies on student learning particular as they address the dropout problem and the lack of skills necessary for college and careers among recent high school graduates. The paper sites lack of education relevance as one factor of low achievement, and contends that career academies are a great solution to this problem

Joining Forces for Student Success: The Emergence of State and Local Policies to Support the Recognition of Academic Credit for CTE Coursework
Association of Career and Technical Education (2009). Alexandria, VA
www.acteonline.org/uploadedFiles/Publications_and_Online_Media/files/academic_integration_paper_WEB.pdf
This paper examines the use of CTE coursework for academic credit. As the level of coursework required for graduation increases, it is important that coursework is still relevant and rooted in real world applications. It draws upon research of the varying CTE systems among the 50 states, and gives specific state examples of how states give academic credit for CTE courses. The paper closes by giving suggestions on implementation of CTE for academic credit programs.

CTE's Role in Science, Technology, Engineering & Math
Association for Career and Technical Education (2009) Alexandria, VA.
www.acteonline.org/uploadedFiles/Publications_and_Online_Media/files/STEM_Issue_Brief.pdf
This brief discusses the STEM challenge (i.e. the lack of STEM professionals and lack of basic mathematics and science skills) and offers CTE programs as a solution. CTE programs can renew interest in STEM fields as students make the connection between the math and science classes they take, and their application in jobs and life. The ACTE brief calls for policies that increase the number of traditionally-underrepresented populations in STEM areas.

Striking the Balance: Career Academies Combine Academic Rigor and Workplace Relevance
Smith, T. (2008) Washington, D.C.: National High School Center.
http://www.betterhighschools.org/docs/MDRC_CareerAcademiesSnapshot_08-01-08.pdf
This National High School Center brief offers a snapshot of the LIFE Academy of Health and Bioscience to demonstrate the importance and effectiveness of career academies, and show some of the challenges career academies face. LIFE Academy offers rigorous science classes and extra support to get students to college, such as SAT help and college counseling. LIFE Academy is still subject to the challenges that are common to career academies such as scheduling issues and providing rigorous courses that fall within the academy sequence.

Retooling Career Technical Education
NGA Center for Best Practices (2007). Washington, D.C. **http://www.nga.org/Files/pdf/0706TECHED.PDF**

This brief discusses the changing nature of career technical education. CTE has evolved from a track labeled (perhaps incorrectly) as less demanding, to one that educates students on a broad range of careers. The new face of CTE mitigates against student dropouts, and makes career education more relevant and rigorous.

STUDENT SUPPORTS

Success at Every Step: How 23 Programs Support Youth on the Path to College and Beyond
Hooker, S. & Brand, B. (2009). Washington, D.C.: American Youth Policy Forum.
http://www.aypf.org/publications/SuccessAtEveryStep.pdf
In this report, the American Youth Policy Forum analyzes 23 programs that have had recent success in preparing students for college and careers. It details the key findings and takeaways, looks at the outcomes and gives an evaluation of the program. The report offers policy recommendations for supporting the college and career readiness of all students.

Grad Nation: A Guidebook to Help Communities Tackle the Dropout Crisis
Balfanz, R., et al (2009). Washington, D.C.: America's Promise Alliance.
http://www.americaspromise.org/~/media/Files/Our%20Work/Dropout%20Prevention/Grad%20Nation%20Guidebook%20052809.ashx
America's Promise Alliance launched Grad Nation, a resource designed to help communities develop tailored plans for keeping students on track to graduate from high school and prepare for college, careers and life. It provides research-based guidance for addressing the dropout crisis, offering ready-to-print tools and links to online resources.

Preparing High School Students for Successful Transitions to Postsecondary Education and Employment
Bangser, M. (2008) Washington, D.C.: National High School Center.
http://www.betterhighschools.org/docs/PreparingHSStudentsforTransition_073108.pdf
This brief examines the difficulties students face in successfully completing high school and moving on to postsecondary institutions or careers and the effective interventions that must be in place to ensure that students transition successfully. The brief looks at specific programs that help make the transition to postsecondary work successful, such as early college high schools and Tech Prep programs. It also addresses issues such as when interventions should start, the types of approaches that should be administered, and how comprehensive the interventions must be.

Approaches to Dropout Prevention: Heeding Early Warning Signs with Appropriate Interventions
Kennelly, L. & Monrad, M. (2007) Washington, D.C.: National High School Center.
http://www.betterhighschools.org/docs/NHSC_ApproachestoDropoutPrevention.pdf
This report outlines steps that schools can take to identify at-risk students and provide support systems and interventions to assist students in obtaining a high school diploma. Further, it discusses the use of early warning data systems to target interventions for groups and individual students, offers a variety of best practice approaches undertaken by higher-performing high schools, and presents effective programs that are being implemented to address the dropout problem.

TEACHER CAPACITY

2009 State Teacher Policy Yearbook.
National Council on Teacher Quality (2009). Washington, D.C.
http://www.nctq.org/stpy09/reports/stpy_national.pdf

Each year, NCTQ reports on the most prominent issues effecting teachers and gives an analysis on the state of the teaching profession in terms of policy, rules and practices employed across states. As part of the yearbook, the organization surveys the fifty states and the District of Columbia, and includes state-specific reports.

Tackling the STEM Crisis: Five Steps Your State Can Take to Improve the Quality and Quantity of its K–12 Math and Science Teachers
National Council on Teacher Quality (2009). Washington, D.C.
http://www.nctq.org/p/docs/nctq_nmsi_stem_initiative.pdf
This brief looks at the STEM teacher capacity problem from the state level, and offers solutions for policy makers interested in addressing the issue. The five solutions offered by the brief are to: raise standards for what it takes to get into an education school, improve the quality of undergraduate preparation, recognize the need for creative and diverse solutions, send qualified teachers to the schools that most need them, and remember it is the PK-12 system that produces our future STEM teachers.

Teaching for a New World: Preparing High School Educators to Deliver College- and Career-Ready Instruction
Miller, M. (2009). Washington, D.C.: Alliance for Excellent Education.
http://www.all4ed.org/files/TeachingForANewWorld.pdf
This brief stresses the importance of highly effective teachers in the classroom and offers five areas of focus: focus on teacher performance instead of teacher education coursework, encourage the creation of performance-based assessments, increase the supply of high-quality teachers by supporting effective programs and closing ineffective programs, build and enhance robust data systems, and invest in research.

Building a High-Quality Education Workforce: A Governor's Guide to Human Capital Development
Grossman, T. (2009). Washington, D.C.: NGA Center for Best Practices.
http://www.nga.org/Files/pdf/0905BUILDINGEDUWORKFORCE.PDF
This report recognizes that effective teachers are the primary influence on student achievement. It provides suggestions for state action towards strategies to ensure the increase in effective educators. The report calls for three main approaches for human capital development: selectively recruit prospective teachers and principals to the profession, improve the pre-service training of prospective teachers and principals, and work to retain the most effective teachers and principals.

Educating School Teachers
Levine, A. (2006). Washington, D.C.: The Education Schools Project.
http://www.edschools.org/pdf/Educating_Teachers_Report.pdf
This report tackles the contentious issue of education schools and their role in educating effective teachers. It researched education schools around the nation to report on the shortcomings they have in teacher preparation, and offer solutions to many of the issues. It also highlights the exemplar teacher education programs that emerged through the study.

K-12 ACCOUNTABILITY

College- and Career-Ready: Using Outcomes Data to Hold High Schools Accountable for Student Success
Aldeman, C. (2010) Washington, D.C.: Education Sector. www.educationsector.org/usr_doc/College-Ready.pdf
This report notes that the best way to measure whether students are prepared for college or a career is by looking at what actually happens when students arrive at their intended destination. The report cites examples of schools that did make "adequate yearly progress" (AYP) under No Child Left Behind, yet whose students

were not successful in college. It offers suggestions on ways states could use existing data systems to create richer, more multi-dimensional measures.