A.3 Program of Instruction

According to the Educational Philosophy of Western School of Science and Technology: A Challenge Foundation Academy ("Western Tech: CFA"), the four major foundations of student learning at Western Tech: CFA will be hybrid (or blended) learning, a curricular focus on science, technology, engineering, and math (STEM) throughout all grade levels, Advanced Placement college-aligned courses in grades 9 through 12, and Core Knowledge in grades 7 and 8.

A. Curriculum and Alignment

The following details the curriculum for Western Tech: CFA in the core academic content areas of English language arts, social studies, mathematics, science, and foreign language, including as it relates to alignment to Arizona Common Core State Standards.

English language arts
The English language arts curriculum at Western Tech: CFA will encourage mastery of academically rigorous reading and writing skills to ensure that students are academically prepared for the rigors of college matriculation and graduation leading to career success.

English language arts in 7th and 8th grades will closely follow the *Core Knowledge Sequence*. The *Core Knowledge Sequence* is a coherent, cumulative, and content-specific curriculum designed to ensure all students have the requisite background knowledge to be successful in secondary and postsecondary education. By grounding curriculum in the *Core Knowledge* Sequence, English language arts curriculum in the middle grades will ensure alignment to Arizona Common Core State Standards, as the Core Knowledge Foundation was a consultant in the development of Common Core Standards. The texts to be studied in 7th and 8th grades will be drawn from the *Core Knowledge Sequence* and also include culturally relevant selections reflective of students' ethnic, racial, and socioeconomic backgrounds, reflecting Western Tech: CFA's core value of relevance.

Building upon this background, English language arts curriculum in 9th through 12th grades will be literature-based that builds toward mastery of the requirements of the AP English Language and Composition exam, a rigorous bar of achievement that reflects a leading indicator of college readiness and success. Additionally, texts will be rich and rigorous and include culturally responsive selections that reflect Western Tech: CFA's core values of achievement and relevance.

Through literature-based discourse in the English language arts curriculum, curricular materials will, in many cases, be teacher-created designed to drive toward advanced understanding of rich, rigorous, and relevant texts.

A special emphasis of English language arts curriculum will be ensuring alignment with the social studies curriculum, as the two courses will be taught in a combined block.

Social studies
An enlightened understanding of the history, geography, civics, and economics is crucial for college preparation.

In all grades, social studies content will align to the Arizona State Standards. In addition, social studies courses in 7th and 8th grades will closely follow the *Core Knowledge Sequence*. The *Core Knowledge Sequence* introduces many high-level concepts in social studies content. At the high school level, social studies will prepare students for the advanced discourses sure to be found in the postsecondary

educational context, as well as provide requisite background knowledge necessary to understand advanced texts.

In addition, as English language arts and social studies will be taught in a combined block, social studies curriculum will provide opportunities for further practice of reading and writing skills, reflective of the Common Core shift toward literacy through the content areas. To that end, curricular materials in many cases will be teacher-created materials aligning to rich text designed to lead to advanced understanding of historical, geographical, civic, and economic topics.

Mathematics

Advanced understanding and application of mathematics will be crucial for the college and career prospects of Maryvale students, especially considering the currently low educational outcomes in mathematics in the target community. The strong focus on mathematics curriculum will also be reflective of the STEM focus of Western Tech: CFA.

All mathematics instruction will be backwards aligned to the requirements of both the Arizona Common Core State Standards and the AP Calculus exam, even in middle school. However, additionally in middle school, mathematics instruction will align to the *Core Knowledge Sequence*, again representing the background knowledge in mathematics necessary to be successful in secondary math. In high school, direct connections will be made to align to the requirements of AP Calculus.

To increase the relevance of the mathematics curriculum, where applicable, natural interdisciplinary overlaps will be drawn to science and the other STEM fields.

Mathematics curricular materials will be a combination of rigorous textbook and teacher-created materials that drive toward the end goal of success on the AP calculus exam.

Science

A rigorous, relevant science curriculum is crucial to students' long-term college and career prospects in Arizona's new STEM-based economy and will be reflective of the STEM focus of Western Tech: CFA.

Science curriculum will align to both Arizona State Standards and Next Generation Science Standards, a rigorous college- and career-preparatory approach to science education that places a premium on technology, engineering, and problem-solving and communication skills.

As in the other core content areas, science instruction in 7th and 8th grades will follow the *Core Knowledge Sequence*, which provides the needed background knowledge in the physical, biological, and chemical sciences for students to be successful in secondary and postsecondary science. In 9th through 12th grades, science curriculum will closely align to the requirements of relevant AP courses, including biology, chemistry, physics, and environmental science. Science will be taught through an exploratory, problem-based lens, with a focus on laboratory skills.

Foreign language

In 7th through 12th grades, students will have the option of choosing either Spanish or Mandarin Chinese as a foreign language. To prepare for both college and career, students must have proficiency in a foreign language. Curricular materials will be based in hybrid instruction and facilitated by instructional aides. Curricular standards, scope, and sequence will be adapted from online curricula.

STEAM electives

Reflecting the focus on the STEM fields, and also noting the importance of the arts in preparing well-rounded students for college and career success, students will engage in rigorous, relevant curriculum in

the STEM fields and arts, also called STEAM. These courses, while they will vary, will be teacher-designed exploratory courses that expose students to the interconnected nature of science, technology, engineering, arts, and mathematics, and in many cases, will be drawn from partnerships with higher education and business partners.

Problem-Based Learning
Aligned with the core value of relevance, Western Tech: CFA will also implement problem-based instruction in science and STEAM elective courses. Problem-based learning is a pedagogy whereby teachers act as facilitators of student learning by guiding students through real-world "problems" or "cases." Problem-based learning is used in several Arizona STEM-model schools and has been shown to increase student motivation.[1]

Meeting the Needs of Special Education Students
Pursuant to the Educational Philosophy, which states that Western Tech: CFA will ensure high expectations for learning and achievement while meeting the needs for all students, the school will ensure a free and appropriate public education for identified students requiring special education services. Western Tech: CFA will be sure to hire at least one highly-qualified special education teacher to serve those students' needs, with all teachers annually receiving training in the planning, delivery, and statutory compliance for students receiving special education services. In delivering instruction to identified students with special needs, Western Tech: CFA will comply with all applicable state and federal requirements, including Title II of the Americans with Disabilities Act of 1990 (ADA), Individuals with Disabilities in Education Act (IDEA), and Section 504 of the Rehabilitation Act of 1974. Thus, Western Tech: CFA will deliver instruction to identified students with special needs in the least restrictive environment (LRE) pursuant to such students' individual education plans (IEPs).

Meeting the Needs of English Language Learners
Considering the demographics of the Maryvale neighborhood, Western Tech: CFA expects a high population of English Language Learners (ELLs). Again, Western Tech: CFA will be sure to meet the needs of its ELL population. Western Tech: CFA will hire teachers with Structured English Immersion (SEI) endorsements and provide periodic development in best practices of instruction for ELLs. To identify ELLs, Western Tech: CFA will use the Primary Home Language Other Than English survey (PHLOTE), and monitor such students' progress with the Arizona English Language Learner Assessment (AZELLA). Pursuant to the results of the AZELLA, Western Tech: CFA will offer SEI or provide students instructional services according to their Individualized Language Learner Plans (ILLPs). Western Tech: CFA will use the results of assessment to cater to students' needs and, while adjusting curriculum and instruction, aims to reclassify ELL students as Reclassified Fluent English Proficient (RFEP) as expeditiously as possible.

B. Methods of Instruction

Instruction, taking place in tandem with curriculum, assessment, and professional development systems, will be based upon the Response to Intervention Model and facilitated through both Hybrid Learning and in-classroom instructional best practices. Hybrid learning, the Response to Intervention Model, and research-based best practices will allow Western Tech: CFA's teachers to use the most effective techniques possible to address all student learning needs, thus fulfilling Western Tech: CFA's mission.

Hybrid Learning
Hybrid Learning is the combination of online and traditional classroom learning that leverages technology to control some element of the time, place, path, and pace of learning. Carpe Diem, a school in Yuma,

[1] De Gallow. What is problem-based learning? Retrieved from http://www.pbl.uci.edu/whatispbl.html.

Arizona, utilizes Hybrid Learning and has risen to the top 10% of Arizona charter schools.[2] Three models of Hybrid Learning will be implemented:

- The Rotation Model
  In the Rotation Model, students rotate from various stations between online learning and traditional classroom instruction. The "flipped classroom" is an example of this model, and will provide the cornerstone for mathematics instruction at Western Tech: CFA. "Flipped classrooms" deliver lectures regarding new material and modeling online as out-of-class work, and class periods are devoted to guided and independent practice. Teachers can utilize or personalize instructional videos provided by Khan Academy and other organizations to deliver new materials and modeling at home, during Acceleration blocks, or in class. Teachers can thus work individually with students or in small groups more effectively.

- The Self-Blend Model
  Students will take full online courses on their own while attending a campus, allowing students control over pace of learning. At Western Tech: CFA, foreign language courses vital to student success in the global technological economy will be delivered in this manner. Foreign language courses in Spanish or Mandarin Chinese will utilize software, monitored by instructors.

- The Flex Model
  Teacher-directed, student-paced remediation and enrichment (Acceleration) courses in language arts and mathematics will utilize the Flex Model of blended learning, in which students' schedules are fluid, such that they proceed at their own pace thorough a given learning path. The CompassLearning Odyssey software will provide an individualized curriculum to best suit each student's learning needs. This provides cost efficiencies by placing paraprofessionals as the direct supervisors of teacher-directed learning paths.[3] In addition, CompassLearning Odyssey software has proven incredibly useful at improving disadvantaged students' education outcomes – usage of CompassLearning Odyssey in the Cliffside, North Carolina school district increased students' reading scores by 20 points and math scores by 30 over just one year.[4]

Response to Intervention (RTI) Model

Western Tech: CFA will utilize the RTI model to structure classroom instruction.

> *RTI has been broadly described as a process in which students are provided quality instruction, their progress is monitored, those who do not respond appropriately are provided additional instruction and their progress is monitored, and those who continue to not respond appropriately are considered for special education services [or individual remediation or enrichment].*

RTI has been found to be a successful instructional model for all learners to receive individualized instruction to meet their needs – a key goal of Western Tech: CFA. RTI is seen as a three-tiered model.[5]

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[2] National Charter School Resource Center. (2012, September 12). Blended learning in charter schools. Retrieved from http://www.charterschoolcenter.org/webinars.

[3] Ibid.

[4] CompassLearning Odyssey. (2011). Equity for disadvantaged students in rural North Carolina. Retrieved from http://www.compasslearning.com/files/success_stories_24.pdf.

[5] Bradley, R., L. Danielson, and J. Doolittle, "Response to Intervention". *Journal of Learning Disabilities* 38.6, Nov./Dec. 2005. Pp. 485-6.

Tier 1 consists of a universal intervention: regular, in-class instruction for all learners. It is delivered in large groups and utilizes at-grade-level content utilizing highly-effective instructional strategies. Differentiation occurs during Tier 1 such that 80-90% of students can be expected to master ELOs at this level.

If In-Class Formative assessment results suggest a student has not mastered particular ELOs to the level of mastery set by the Governing Board, students will move to Tier 2 intervention. Tier 2 is differentiated, need-based learning for learners needing remediation on specific skills. It will occur during the Acceleration block through Hybrid Learning using CompassLearning Odyssey. Teachers will design online learning path to address gaps in mastery. Students will be continuously progress monitored throughout Tier 2 interventions.

Tier 3 is for learners still not responding to Tier 1 and Tier 2 instruction. Intensive Intervention in Tier 3 is individualized, need-based learning for students. Tier 3 will address specific skill needs in one-on-one and small-group online and in-person settings during the Acceleration block. Progress monitoring will be constant. Students still not responding through Tier 3 interventions will be referred to Special Education services.

Research-Based Instructional Best Practices

In the context of the RTI model, Western Tech: CFA's teachers will utilize research-based instructional best practices to deliver content and curriculum to students. Teachers will receive training in the following instructional methodologies, which are identified as best practices through extensive bodies of research.

Objective-driven instruction

All lessons at Western Tech: CFA, including hybrid learning lessons, will be driven by objectives that align to Western Tech: CFA's curricular ELOs. Research suggests that lessons backwards-aligned from objectives are more effective than those which are not.[6]

Cooperative learning structures

Based on the work of Dr. Spencer Kagan, cooperative learning structures are designed to "increase academic achievement, improve social skills and social relations, improve thinking skills, reduce discipline problems, and [facilitate the] acquisition of leadership and employability skills."[7] Cooperative learning structures will be utilized in all in-person classrooms.

High-yield instructional strategies

High-yield instructional strategies are the strategies identified as most effective in the meta research of Robert Marzano. High-yield strategies will be utilized in all in-person classrooms. Such strategies include vocabulary building and instruction, feedback and praise, graphic organizers, identifying similarities and differences, goal-setting, generating and testing hypotheses, and summarization[8]

Socratic seminars

Socratic seminars are designed to allow participants to deeply understand a text or a concept. Socratic seminars involve advanced reading of a text followed by preparation of questions and discussion starters. Then, participants systematically question other members of the seminar, with the teacher modeling and

[6] Marzano, R., D. Pickering, and J. Pollock. (2004). Classroom instruction that works. Pearson: New York.
[7] Kagan, S. (2008, Summer). Kagan structures simply put. Retrieved from http://www.kaganonline.com/free_articles/dr_spencer_kagan/ASK38.php.
[8] Marzano, R., D. Pickering, and J. Pollock. (2004). Classroom instruction that works. Pearson: New York.

facilitating instruction. Such a method will be utilized in in-person classes and integrates literacy and the content areas. Socratic seminars are based upon the research of Dewey, Vygotsky, Piaget, and Friere.[9]

Flipped classrooms

Flipped classrooms are a relatively new model of instruction in which students watch an instructional video introducing new material for homework, and a teacher uses class time to coach and correct students as they work through practice problems. Teachers can thus maximize in-class time with students and immediately respond to different students' learning styles. The Khan Academy provides such videos online for free for mathematics instruction.[10]

Differentiation Strategies

Differentiation can be defined as "a strategy that plans for and designs assignments, lessons, activities, tasks, and projects to match student needs…students [will] learn the same concepts or skills but may approach them through different activities."[11] Differentiation is a crucial aspect of effective instruction at all levels of the RTI model. Teachers will differentiate content, process, or product according to students' readiness, interest, and learning profile, considering multiple intelligences, leading to "optimal learning experience for [all] students."[12]

Alignment and Implementation of Instruction

Collaborative teams will align research-based instructional methodologies with the particular needs of Common Core State Standards, a course, or a class of students. Adjustments will be made based upon the results of collaborative team co-observation cycles and student outcomes. In addition, the implementation of the effective instructional methodologies mentioned above will be supported by administration. Western Tech: CFA will ensure staff is well-trained in the instructional methodologies outlined above through professional development sessions.

Sample Instructional Day with Instructional Methods Emphasized

Objective-driven instruction, differentiation strategies, cooperative learning structures, and high-yield instructional strategies will occur in every course. In addition to these, the following instructional methods will be especially emphasized in the relevant class:

8:30	Arrival	
8:30-8:45	Morning Advisory	
8:50-9:35	Mathematics	Hybrid Learning Rotation Model/Flipped Classroom
9:40-10:25	Humanities (English Language Arts)	Socratic Seminars
10:30-11:15	Humanities (Social Studies)	Socratic Seminars
11:20-12:05	Science	Problem-Based Learning
12:05-12:45	Lunch	
12:45-1:30	Foreign Language	Hybrid Learning Self-Blend Model
1:35-2:20	Acceleration	Hybrid Learning Flex Model
2:25-3:10	STEAM Elective	Problem-Based Learning

[9] Readwritethink.org. (2012). Strategy guide: Socratic seminars. Retrieved from http://www.readwritethink.org/professional-development/strategy-guides/socratic-seminars-30600.html.

[10] Khan Academy. FAQ. Retrieved from http://khanacademy.desk.com/customer/portal/articles/414161-are-you-essentially-%22flipping-the-classroom%22-with-these-pilot-implementations-.

[11] Laczko-Kerr, I. (2012). Creating systems to support student learning. Retrieved from http://www.anymeeting.com/WebConference-beta/RecordingDefault.aspx?c_psrid=EB58D789884A.

[12] Ibid.

3:15-4:00	College and Career Enrichment Course
4:00	Dismissal

Figure A.3.1 Sample Instructional Day with Instructional Methods Emphasized

C. Formative and Summative Assessment Plans

The school-wide system of assessment is research-based and formulated according to the best practices set forth in *Driven by Data*[13]. This plan details how students and teachers will be held accountable for student learning of curriculum, and how instruction and assessment will ensure responsiveness to student needs.

Foundations of the Assessment System
An effective assessment system must meet four essential conditions: clear learning targets (the ELOs of a given course); standards-based instruction aligned to the standards and tests listed above; reliable, valid, bias-free assessments; and effective communication and sharing of results. Western Tech: CFA will be sure to incorporate all four elements in its assessment plan.[14]

Types of Assessments
There are two different types of assessments: assessments *for* learning – formative assessments used to adjust instruction in the classroom according to student need – and institutional assessments *of* learning – summative assessments used as program evaluations of curricular systems and materials and instructional practices. Western Tech: CFA will utilize three types of assessments to assess mastery of curriculum: In-Class Formatives, Quarterly Common Assessments, which are assessments for learning, and Institutional Assessments of learning.

All of the below assessments will specifically determine student mastery or lack thereof on Arizona State Standards.

In-Class Formatives
Teachers will use the results of in-class formative assessments to drive and inform instruction. Besides daily checks for understanding regarding mastery of ELOs, teachers will utilize formative assessments after each unit to monitor student achievement and progress. These will take the form of aligned exit tickets or multiple-choice tests, authentic assessments such as projects, written responses, or performance-based tasks, or online assessments through Hybrid Learning software or online programs. The particular formative assessment method chosen will align with the specific instructional methodologies in a given course. The target performance on in-class formatives will be 80% mastery, but adjusted by the Board as needed to continuously improve instructional effectiveness. As assessments for learning, the results of in-class formatives will be used to determine what a teacher will teach next, if a teacher needs to re-teach content using different instructional strategies, which students will be moved to further academic interventions, and what content will be covered during tutoring after school.

Quarterly Common Assessments
Quarterly Common Assessments will be cumulative and common across a course. Collaborative teams will create these in July using Galileo assessment software. They will be backwards-aligned according to the content and rigor expectations of the alignment standards listed above. The target performance on Quarterly Common Assessments will be 80% mastery, but adjusted by the Board as needed to

[13] Bambrick-Santoyo, P. (2010). Driven *by Data: A Practical Guide to Improve Instruction*. San Francisco, CA: Jossey-Bass.
[14] Laczko-Kerr, I. (2012). Creating systems to support student learning. Retrieved from http://www.anymeeting.com/WebConference-beta/RecordingDefault.aspx?c_psrid=EB58D789884A.

continuously improve instructional effectiveness. As assessments for learning, the results of the Quarterly Common Assessments, similar to in-class formatives will be used to determine what, if any, revisions may be necessary to make to the curriculum map to determine what a teacher will teach next, if a teacher needs to re-teach content using different instructional strategies, which students will be moved to further academic interventions, and what content will be covered during tutoring after school.

Institutional Assessments
Institutional assessments are the summative assessments used to assess the efficacy of the school's total Academic Program and whether or not students have mastered Arizona State Standards. Summative assessments to determine mastery of standards include 4th Quarter Common Assessment (using Galileo assessment software) and PARCC tests. Both will align to the Arizona State Standards, and the board shall set mastery targets for each of these institutional assessments to specifically determine student mastery of those standards. In addition, summative institutional assessments will include the PSAT, ACT, and AP assessments. Curricular materials will be aligned to the rigor of such assessments and curriculum will be backwards-planned to each assessment.

Usage of Summative Assessment Data[15]
At the beginning of each year, Western Tech: CFA will use summative assessment data from all of the above assessments from the previous year as a baseline for student performance. Data will be used to build an instructional and curricular program that addresses the needs and gaps illustrated by summative assessment data. Teachers will use data days to look at students' growth vs. the baseline identified by the previous year's summative assessment, and then teachers will personalize students' learning paths to target skill instruction while aligning to next year's summative assessment.

D. Alignment of Program of Instruction and Performance Management Plan

The entirety of this Program of Instruction will align to the Performance Management Plans for both mathematics and reading, detailed in section A.5.

[15] Adapted from the Hirsch Academy: A Challenge Foundation Academy charter application, approved by the Arizona State Board for Charter Schools on January 14, 2013.