**Part 1: Introduction to Standards Based Integrated Curriculum**

**Introduction:**

A key component of career academies and all Linked Learning Pathways is highly engaging integrated curriculum. This workshop is designed to demonstrate how rigorous interdisciplinary lessons and projects that can engage students differently and more consistently are designed.  There is a fairly simple approach with new tools that is working well for many academy teams.  This curriculum development process involves clarifying student learning outcomes and using performance maps to assist teachers in finding connections and building lessons or projects based on standards from multiple courses. ConnectEd has developed an online tool to simplify the development process yet maintain the integrity of each subject'

**Outcomes:**

* Discuss and describe the process and the power of using student outcomes to drive C&I
* Identify the elements of quality integrated curriculum
* Discuss the pros and cons of finding curricular connections with performance maps

**Student Outcomes**

**What are student outcomes?**

It is useful to make a distinction between "student learning outcomes" and "student outcome measures.”

Student learning outcomes are the skills, knowledge, and abilities that students have attained as a result of their educational experiences.

Student outcome measures refer to aggregate statistics on groups of students, like graduation, retention, transfer, and employment rates. These are institutional outcomes; they measure comparative institutional performance, not outcomes for individual students that result from their school experience. They are often associated with accountability reporting.

# ::Student Outcomes graphic2.pdf

# Developing Multidisciplinary Integrated Curriculum

## Curriculum/Performance Mapping

Each team member records and shares the scope and sequence of our course with the team. This mapping process should include standards and original performance measures that students are expected to demonstrate over the course of the year. This does help to clarify your own thinking regarding how your course is sequenced, but for integrated curriculum development the primary goal of curriculum (and performance) mapping is for all team members to become familiar with each others’ subjects so the team can recognize how their subjects are related and find common connections.

Overarching Concept or Topic

As a team, examine the existing scope and sequence of concurrent academic and CTE classes to identify related concepts and content knowledge. Your goal is to find authentic connections between the existing standards-based curriculum and performance measures, not to insert additional curriculum into your schedules. Inclusion of CTE into this process is vital, because real-world problems are often the contexts that allow seemingly unrelated content to be connected authentically. After considering the identified possibilities, choose a theme that crosses multiple subject areas. Also consider which themes will be of interest to your students, to you as instructors can be supported by local industry partners.

Essential Question/s

Set up a need-to-know learning opportunity for students by framing the unit and driving the instruction with an essential question. The overarching question should be broad and open-ended, requiring students to synthesize learning from multiple classes to fully answer. This essential question can and should be broken down into smaller sub-questions that can be addressed in the individual classes through individual lessons that are brought together by the culminating project.

Authentic Project and Performance Assessments

Each subject area should have individual performance assessments, but should also contribute to the culminating project as a whole. The performance assessments associated with the culminating project should provide students with the opportunity to directly apply the content they learned in each subject matter in meaningful ways.

Industry Partners

Industry and post-secondary partners can have roles at various stages. During curriculum development, partners can be brought in to help in planning, with identifying authentic connections and projects, and to provide specialized content knowledge. During implementation, industry professional can be co-instructors, serving as guest speakers, sponsoring site visits, or providing feedback for ongoing student work. At the end of the unit, industry and post-secondary partners can help to evaluate the final project to industry standards.

Reflection and Revision

*During and after implementation, plan time to meet as a team to discuss how the different pieces of fit together and whether or not the lessons and the unit were effective in engaging students and achieving your anticipated learning outcomes.*

***The Six A’s of Instructional Design: PBL Rubric Total Score: \_\_\_\_***

Draft

0 = No evidence 1 = Minimal evidence 2 = Sufficient evidence 3 = Good evidence 4 = Exceptional evidence

***Authenticity Score:* \_\_\_**

* The project results in an industry valued product, performance, service or solution to a genuine, complex problem
* The work has personal meaning and significance to the student’s interest and/or goals

***Assessment Practices Score:* \_\_\_**

* The students reflect regularly on their learning, using clear project criterion that they have helped to set.
* The adult partners help students develop a sense of the real world standards for this type of work
* There are opportunities for monitoring progress and assessing student work through a range of methods, including exhibitions and/or portfolios.

Adapted from *Real Learning, Real Work* by Adria Steinberg, 1997. Revised 1/21/11.

***Academic Rigor Score:* \_\_\_**

* The project leads students to acquire and apply knowledge and master performances related to the standards in the content areas that are currently being, or have recently been, addressed (Cross disciplinary performance maps were used to develop the project)
* The project challenges students to use methods of inquiry central to one or more discipline.

\_\_\_ (e.g. to think like a scientist, solve like a mathematician, question like a social scientist)

* The students develop higher order thinking skills, habits of mind and 21st century skills (e.g. searching for evidence, taking different perspectives, finding novel solutions)

***Applied Learning Score:* \_\_\_**

* Classroom learning for some of the standards takes place in the context of a central problem or process within the larger project
* The project leads students to demonstrate mastery of the pathway outcomes that include 21st Century skills; e.g. teamwork, appropriate use of technology, problem-solving, communication
* The work requires students to develop organizational and self-management skills.

***Active Exploration Score:* \_\_\_**

* The students spend significant amounts of time doing field-based work.
* The project requires students to engage in real investigation, using a variety of methods, media and sources.
* The students are expected to communicate what they are learning through presentations,\_\_\_ products demonstrations or performances.

***Adult Relationships Score:* \_\_\_**

* The students meet and observe adults who have expertise and experience relevant to the project.
* The students have an opportunity to work closely with at least one industry partner.
* The adult partners collaborate on the design and assessment of student work.

**SAMPLE PROJECT #2**

DEER VALLEY LAW ACADEMY

ANTIOCH, CA

***Topic*: Forensic Investigation**

**Pathway Outcome:** Employs appropriate terminology when accurately communicating technical and legal information verbally or in writing.

**STUDENT PERFORMANCES**

**Biology:**

1. Explain how the coordinated structures and functions of organ systems allow the internal environment of the human body to remain relatively stable (homeostatic) despite changes in the outside environment.
2. Compare the general structures and functions of DNA, RNA and protein. Know how basic DNA technology (restriction digestion by endonucleases, gel electrophoresis, ligation and transformation) is used.
3. Conduct blood typing on a blood sample through antigen testing.
4. Identify the differences between blood types.

**Algebra I:**

1. Solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.
2. Graph a linear equation and compute the *x-* and *y-*intercepts.
3. Verify that a point lies on a line, given an equation of the line.
4. Derive linear equations by using the point-slope formula.

**Language Arts:**

1. Analyze interactions between main and subordinate characters in a literary text and explain the way those interactions affect the plot.
2. Analyze and trace an author’s development of time and sequence, including complex literary devices (e.g., foreshadowing, flashbacks).
3. Apply appropriate interviewing techniques: prepare and ask relevant questions; make notes of responses; compile and report responses; evaluate the interview’s effectiveness.

**Foundations of Law:**

1. Understand specialized investigative techniques, devices and equipment to enhance investigation regarding compliance with laws and regulations.
2. Conduct interviews and interrogations with individuals using proper procedures to ensure the protection of individual rights and information gathering.
3. Apply active listening skills to obtain and clarify information.
4. Analyze and interpret nonverbal communication cues to discern facts from fabrication.

**PROJECT DESCRIPTION:** Students will take on the role of crime scene investigators to solve a murder that has occurred at the school. They will integrate math, science and language arts into the study of forensic science and associated careers such as law enforcement officers and district attorneys. Students will secure the crime scene, conduct a law enforcement investigation, conduct interviews, interrogate witnesses and suspects, write up a narrative police report with witness statements, including scientific lab report attachments, and present their findings. The culminating assessment will be a presentation to the District Attorney of the written report, and an oral report with a multimedia PowerPoint of the evidence. The goal is to persuade the DA of the suspect’s guilt and the charges to be brought.

**DRIVING QUESTION:** What are the appropriate roles for scientific technology and human judgment in bringing criminal charges against a defendant?

**Geometry:**

1. Construct and judge the validity of a logical argument and give counterexamples to disprove a statement.
2. Prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.

**World History:**

1. Describe events and explain the issues associated with war crimes and crimes against humanity, and identify the role forensic science plays in bringing war criminals to justice.

**PERSONALIZATION OPTIONS**

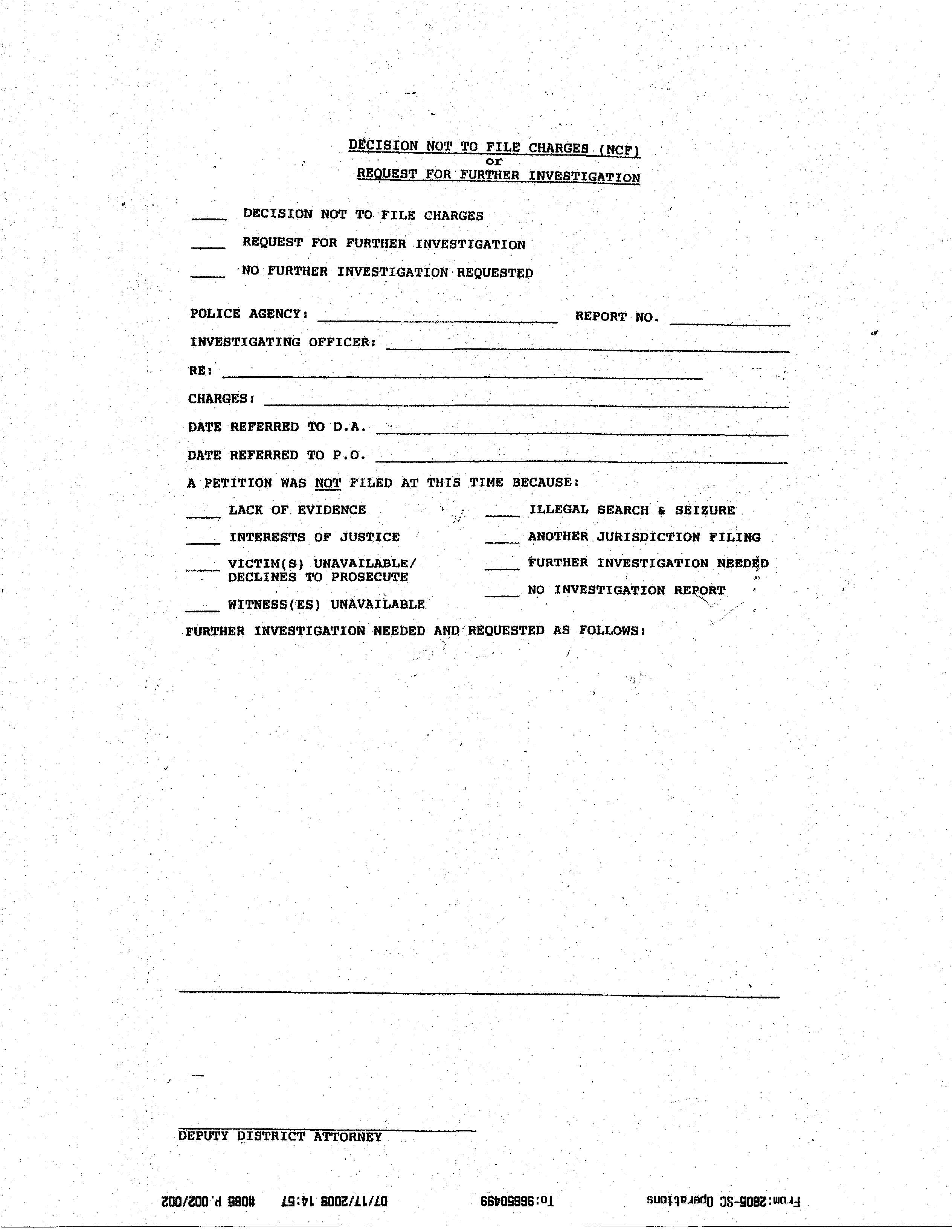
|  |  |  |  |
| --- | --- | --- | --- |
| **Project activities and time lines** | | | |
| **Activity** | **Staff responsible** | **Timeline** | **Product/result** |
| Establish project activities and timeline | Law Teacher and team | 09/10/09 | Project plan |
| Scenario and evidence collection | Law Teacher, Math Teacher, Biology Teacher, Law Enforcement Experts | 10/30/09 | Crime Scene  Blood typing report  Math scenarios report  DNA Report |
| Instruction on conducting interviews and interrogations with law enforcement expert | English Teacher, Law Enforcement Expert | 11/02/09 | Notes, handouts, students interview each other |
| Instruction on writing interviews | English Teacher | 11/04/09 | Notes, handouts, students interview each other |
| Conducting interviews. | Law Teacher and witnesses | 11/06/09 | Students interview witnesses and suspects |
| Draft Report #1 with expert input | Law Teacher, English Teacher | 11/11/09 | Draft narrative police report |
| Draft Report #2 with expert input and multimedia component | Law Teacher, English Teacher | 11/20/09 | Draft narrative police report with attachments |
| Culminating Activity: Present persuasive written and oral report with multimedia presentation to industry mentor (District attorney) and defend during oral interview. | All teachers and industry mentor (District Attorney) | 12/11/09 | Narrative written report, oral report, multimedia presentation |

Project options:

1. Students can extend the multimedia components of the evidence collection to use scenes from videotaped witness interviews.
2. Students can conduct additional investigations with CSI professionals.

**Rubric: Presentation to DA**

|  | **Rating**  **Score** | **Exemplary** | **Proficient** | **Unsatisfactory** |
| --- | --- | --- | --- | --- |
| **CATEGORIES** | **3** | **2** | **1** |
| **Decorum** |  | * Follows proper rules of procedure * Interacts and addresses all parties appropriately and stands to present * Does not laugh inappropriately or otherwise detract from the seriousness of the proceeding * Is properly dressed; is not wearing a hat * Is not eating/drinking/chewing gum * Has electronic devices turned off * Maintains credibility | * Displays proper proceeding behavior except for some minor deviations from #3 * Maintains substantial credibility | * Major deviations from #3 * Obviously does not take the exercise seriously and deviates so substantially from the proceeding behavior that the performance of other students is adversely affected * Shows lack of credibility |
| **Delivery**  **&**  **Persuasiveness** |  | * Displays ease in communication and is easily understood * Speaks clearly with precise pronunciation and enunciation * Volume and pace reflect intensity of main points * Uses proper language and grammar; Exhibits very few disfluencies such as “ahs”, “uhms” or “you know” * Makes appropriate eye contact * Uses body language, facial expressions, and movement to make remarks, questions, or responses persuasively, confidently and convincingly * Responses are directed appropriately, and responsive to the question that was asked | * Communication is adequate and understood * Volume and pace are consistent * Eye contact is intermittent * Lapses in sentence structure * Some grammatical errors or disfluencies * Body language, facial expressions and movements are used hesitantly or reflect nervousness * Responses are directed adequately and responsive to the question that was asked most of the time | * Shows difficulty communicating * Lack of eye contact * Rate is too fast or slow; pauses are at inappropriate spots * Responses or questions are not clearly articulated or audible; voice projection is poor * Is asked to repeat questions because they are not heard or understood * Uses improper language and grammar; exhibits many disfluencies * Lack of interest or focus * Body language, facial expressions, and movement to make remarks, questions, or responses are done with little persuasion, confidence, conviction and/or with much nervousness * Responses are not directed appropriately, or are not responsive to the question that was asked |
| **Opening**  **&**  **Closing**  **Statements** |  | * A persuasive opening statement is delivered without notes that explains the theory and shows how the testimony, burden of proof, and relevant law compel the conclusion that the theory should prevail * Persuasively summarizes the theory of the case and the law, showing why the burden of proof has been met in favor of the officer * Thanks the DA | * An opening statement is delivered with minimal use of notes that explains the theory and adequately shows how the testimony, burden of proof, and relevant law compel the conclusion that the theory should prevail * Outlines the strengths of the witnesses but was unable to be flexible and adjust statement to weaknesses and contradictions * Most of the evidence needed to prove the case is present * Used notes minimally * Physical evidence and/or state applicable statues were not mentioned * Reminder to the DA of the required burden of proof and/ or requesting the verdict were hastily mentioned * Thanking the DAs | * Position not clearly established * Closing statement was lacking evidence needed to prove the case. * Does not outline the strengths of the witnesses and did not adjust statement to weaknesses and contradictions * Argument was not organized * Heavy use of notes * Failed to remind prosecutor of the required burden of proof and/or requesting the verdict * Did not thank the DA |
| **Analytical**  **&**  **Strategic**  **Mastery** |  | * Demonstrates full knowledge of the case with explanations and elaboration that is factually accurate * Provides a logical and relevant sequence of events * Develops the case theory and explains away inconsistencies * Enhances the credibility of the witness statements and evidence * Asks relevant questions and stops when ahead * Questions strengthen the theory of the case or attack the credibility of an opposing witness * Adapts quickly to unexpected statements and incorporates such into the closing argument | * The theory of the case can be discerned, and is not clearly contradicted, but could have been more persuasively and convincingly highlighted * Arguments show some recognition of a coherent theory of the case, but the strategy is less apparent or not as persuasively articulated or developed as in #3 * Use of notes in questioning or in opening and closing statements detract from effectiveness and persuasiveness. | * There does not seem to be a theory of the case, or mutually contradictory theories are offered * The arguments show virtually no indication of a case theory * The questions are often irrelevant and many relevant questions are omitted * The possible bias of witnesses is unexplored and reliance on notes is such that it is apparent that there has been inadequate preparation or that the materials were prepared in haste * The presentations show a lack of understanding of the burden of proof and the law of the case |
| **Research**  **&**  **Preparation** |  | * Obtained information from favorable witnesses in order to prove the facts of the case * Has reviewed witness statements and evidence in advance; * Preparation for the proceeding is evident * Information is complete * Applicable rules of law have been researched thoroughly | * It is clear at times that more reviewing of questions and answers would have made for a more effective presentation in terms of preparation of witness statements and evidence in that witness statements are only slightly credible * There are some indications of adequate preparation, but not in all instances where it might have helped * Applicable rules of law have been researched minimally | * There is a clear lack of preparation in that witness statements lack credibility, with many questions clearly being a surprise to the DA * Preparation is lacking * Information is incomplete * There is a lack of research of applicable rules of law |
| **Visual**  **Presentation** |  | * Exhibits and documents are properly offered for identification and for admission as evidence in the case * Visuals are appropriate, explainable, and reinforce the theory of the case * Demonstrates remarkable use of technology resources to present visuals | * Most of the exhibits and documents are offered for identification and for admission as evidence in the case * Visuals are adequate to help the case but need further explanation * Demonstrates proficient use of technology resources | * There are no exhibits and documents are offered for identification and for admission as evidence in the case or they are substantially lacking * Visuals are inappropriate and/or inadequate in reinforcing the theory of the case and need much explanation * Visuals are lacking or not used * Demonstrates lack of competence using technology resources or no technology incorporation |



Performance Based Integrated Curriculum

**Reflection Question 1**

**What does a quality integrated project look like?**

1. **Levels of integrations**

* What levels of integration are currently in use within your academy area or discipline?
* What are the expectations for academy regarding the number and level of integrated projects?
* Do expectations vary by teacher, pathway, and/or site? Why and how?

1. **Identifying key elements of quality (using the rubric)**

* Of the integrated activities or projects that you currently see in use, what elements are in place?
* What elements may need some work?

1. **Determining rigor**

How would you assure the principals, teachers, and concerned parents that integrated activities and projects are adequately preparing students for standardized test and post secondary options?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Weekly Performance Map: One Month Sample** | | | | | |
| **Subject** | **WEEK: NOV 2-6** | **WEEK: NOV 8-12** | **WEEK: NOV 15-19** | **WEEK: NOV 21-25** | **WEEK: NOV28- DEC 2** |
| **BIOLOGY** | Use the fluid mosaic model to illustrate and explain the structure and function of the cell membrane.  Predict the movement of different types of molecules across semi-permeable membranes.  Distinguish between active and passive transport along concentration gradients. | Analyze the structural differences between viruses and bacteria.  Compare and contrast prokaryotic cells and eukaryotic cells. | Explain the role of ER, Golgi apparatus, and secretory vesicles in protein synthesis and transport.  Differentiate between the functions of smooth ER and rough ER. | Illustrate how the cytoskeleton or cell wall gives shape and internal organization to the eukaryotic cell.  Describe the structure and function of microtubules, flagella, and cytoskeleton | Determine the relationship of cell structure with function.  Differentiate among multiple cells types an functions |
| **LANGUAGE ARTS** | Research a topic using a minimum of five different text and multimedia resources.  Evaluate the credibility and reliability of resources. | Summarize research on to note cards, one thought, fact, or quote per card. | Paraphrase research into one’s own words.  Formulate a preliminary thesis statement to reveal the specific point of a paper.  Using note cards, prepare a working outline. | Draft a final thesis statement  Use internal citations after learning MLA format.  Correctly apply MLA format to the citations.  Prepare a formal outline using proper outlining form.  Write rough draft of a research paper. | Peer edit another’s draft with comments.  Review peer feedback on the rough draft and make adjustments  Write the final project in proper MLA format.  Prepare a Works Cited page using proper MLA citations  Prepare a Table of Contents |
| **ALGEBRA** | Solve a linear equation systematically using addition and subtraction.  Solve problems, including word problems, involving linear equations in one variable.  Isolate the variable and solve equations using inverse operations.  Solve linear equations using multiplication and division.  Define the term “reciprocal.” | Find the solution to multi-step equations.  Use two or more steps to solve a linear equation.  Using variables on both sides of the equation, find the answer.  Produce the answer to math questions using decimal equations | Apply a formula to an algebraic equation that relates two or more quantities.  Use a formula to solve a temperature conversion problem.  Use ratios and rates to solve real-life problems  Describe unit rates, such as 60 miles per gallon | Find a unit rate (such as comparing miles and kms).  Apply unit analysis, such as converting dollars into pesos.  Solve percent problems using percents and base numbers. | Solve multi-step problems, including word problems, involving linear equations in one variable.  Solve percent problems by reading tables and graphs. |
| **HEALTH SCIENCE FOUNDATIONS** | Distinguish between pathogenic and non -pathogenic organisms.  Describe how various organisms manifest symptoms in human hosts  Determine common modes of transmission for bacteria, viruses and fungi.  Define vector, fomite, and vermin | Research modes of transmission for a list of common pathogenic organism  Determine appropriate precautions for specific organisms.  Distinguish between sterilization and disinfection.  Differentiate between aseptic and sterile technique | Demonstrate aseptic hand washing technique  Utilize appropriate aseptic and/or isolation techniques according to posted precautions  Define, endemic, pandemic and epidemic.  Determine common risk behaviors shared among endemic infectious diseases. | Utilizes proper sterile technique when assisting with, or performing, sterile procedures.  Safely and correctly operate disinfection and sterilizing equipment and machines  Employ appropriate protective equipment and apparel according to organism identified.  Locate public health warnings and advisories for a list of infective diseases | Clinical assignments |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Performance Map Template** | | | | | |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Reflection Question**

**How do performance maps add value when designing integrated lessons and projects from scratch?**

1. **Intervals of mapping**

* How might maps be designed to accommodate pacing guides and benchmark testing?
* To what extent must team members adhere to scope and sequence within the separate subject coursework?
* How might performance maps help teachers design more authentic work within their own classes?

1. **Modify mapping process for working with specific teams.**

* What format might work best for the team/s of teachers you support (bi-weekly, monthly or semester)?

* What time spans should be worked on at time (consider whether teachers are on block or traditional scheduling, and the available collaboration opportunities of teachers)?
* P

Common Link

Pathway Outcome:

SUBJECT:

SUBJECT:

SUBJECT:

SUBJECT:

SUBJECT:

PROJECT DESCRIPTIONS:

STUDENT PERFORMANCES

DRIVING QUESTION:

**PERSONALIZATION OPTIONS**

**Project activities and time lines**

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Staff responsible | Timeline | Product/result |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Culminating Activity: |  |  |  |

**Reflection Question 3**

**How might you build from the identified connections to design lessons or projects?**

1. **Common links** (ideas, concepts, skills)

What methods have you and your team previously used for finding an interdisciplinary focus. How will using performance maps change current practice

1. **Authentic context**

* How will you get needed input to match academic performances with authentic applications?
* How might industry partners assist you in making the project authentic and provide exposure to actual workplace environments and expectation?

1. **Student activities and assessments**

What strategies might be used to assure that the project requires mastery of the identified academic and technical performances?

1. **Staff roles, actions and timelines for interdisciplinary work**

Who will assure that projects are well organized and that responsibilities are being met?

1. **Time and resources required**

How do you decide which standards and learning outcomes require more or less time and

**Reflection Question 4**

**Can existing curriculum and projects be adapted to accommodate additional subjects and/or align with specific course guides or benchmarks?**

1. **Performance map alignment**

* Do teachers currently employ predesigned integrated curriculum?
* How well do those projects align to your standards and serve your desired learning outcomes?

1. **Adjustments and adaptations**

* Are you confident predesigned curriculum aligns to the quality criteria used earlier (p. 3)?
* How can performance maps help you adapt existing curriculum materials with cross disciplinary connections and products

**Planning to performance map**

**Name of Academy:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Outcome** | **Strategies** | **Timeline** | **Support or Resources Needed** |
| Academy outcomes have been established that align with district and school goals and are taught, monitored and assessed |  |  |  |
| Teachers are confident in unpacking standards and identifying performance levels and tasks. |  |  |  |
| The team uses performance maps and program outcomes when designing integrated lessons and projects |  |  |  |
| Students regularly benefit from rigorous, highly engaging authentic activities and demonstrate mastery with a capstone project. |  |  |  |
| Student progress towards meeting the pathway outcomes is tracked and mastery is validated |  |  |  |
| Program effectiveness is periodically assessed using student performance data and improvement implemented |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |