SCN320  FORENSIC SCIENCE
A Course Outline for Science

Approved by the Board of Education
OCTOBER 22, 2015___________
# Table of Contents

STATEMENT OF PURPOSE .................................................................................................................. 4
THE LIVING CURRICULUM .................................................................................................................. 5
AFFIRMATIVE ACTION ...................................................................................................................... 5
MODIFICATIONS AND ADAPTATIONS ............................................................................................... 5
GENERAL GOALS ............................................................................................................................... 6
GRADING PROCEDURES .................................................................................................................. 7
COURSE PROFICIENCIES .................................................................................................................. 9

I. INTRODUCTION TO FORENSIC SCIENCE .................................................................................. 11
II. EVIDENCE .................................................................................................................................. 13
III. CRIME SCENE INVESTIGATION ............................................................................................... 15
IV. SEROLOGY/BLOOD EVIDENCE ............................................................................................... 17
V. FINGERPRINTS ........................................................................................................................... 19
VI. DNA ........................................................................................................................................... 21
VII. TRACE ..................................................................................................................................... 22
VIII. HAIR / FIBERS ......................................................................................................................... 23
IX. GLASS / SOIL ............................................................................................................................. 24
X. QUESTIONED DOCUMENTS ....................................................................................................... 26
XI. IMPRESSION EVIDENCE .......................................................................................................... 28
XII. PHYSICS OF FORENSICS ......................................................................................................... 30

BIBLIOGRAPHY .................................................................................................................................. 31

APPENDIX A SAMPLE AUTHENTIC ASSESSMENT ...................................................................... 32

AUTHENTIC ASSESSMENT .................................................................................................................. 33

APPENDIX B LAB REPORT RUBRIC .................................................................................................. 34
<table>
<thead>
<tr>
<th>APPENDIX C</th>
<th>SAMPLE STUDENT ASSESSMENTS</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX D: NJSLS STANDARDS</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>APPENDIX E: CURRICULUM MODIFICATIONS &amp; ADAPTATIONS</td>
<td></td>
<td>41</td>
</tr>
<tr>
<td>APPENDIX G</td>
<td>NEW JERSEY STUDENT LEARNING STANDARDS 21ST CENTURY SKILLS</td>
<td></td>
</tr>
<tr>
<td>APPENDIX H</td>
<td>SUGGESTED MODIFICATIONS</td>
<td></td>
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STATEMENT OF PURPOSE

Forensics is a one-semester course designed as a junior/senior elective. The goal of this class is to provide demonstrate the connection between science and forensic investigations. Throughout the course, students explore a variety of real-world issues related to evidence and analysis of evidence collected at crime scenes. Students will evaluate these issues from scientific, legislative, and ethical perspectives utilizing evaluative skills and evidence based argument.

The program is designed as a student-centered, laboratory course. As such, students will perform a variety of laboratory investigations, developing analytical skills, as well as practical skills. Genetics is structured to inspire excitement and enthusiasm for scientific thought in synchrony with developing students who are well informed in a topic that will be an integral part of every citizen’s life.
This course is aligned with the NEW JERSEY STUDENT LEARNING Standards and the NEW JERSEY STUDENT LEARNING STANDARDS for English Language Arts and Mathematics (along with any others that may apply). Separately we assess students to gauge progress and inform instruction. Benchmark assessments for students in grades 9 through 12 are administered in the form of a midterm and final exam for full year courses.
*Special Note: Only final exams are administered at the end of quarter courses and semester courses.
THE LIVING CURRICULUM

Curriculum guides are designed to be working documents. Teachers are encouraged to make notes in the margins. Written comments can serve as the basis for future revisions. In addition, the teachers and administrators are invited to discuss elements of the guides as implemented in the classroom and to work collaboratively to develop recommendations for curriculum reforms as needed.

AFFIRMATIVE ACTION

During the development of this course of study, particular attention was paid to material, which might discriminate on the basis of sex, race, religion, national origin, or creed. Every effort has been made to uphold both the letter and spirit of affirmative action mandates as applied to the content, the texts and the instruction inherent in this course.

MODIFICATIONS AND ADAPTATIONS

For guidelines on how to modify and adapt curricula to best meet the needs of all students, instructional staff should refer to the Curriculum Modifications and Adaptations included as an Appendix in this curriculum. Instructional staff of students with Individualized Education Plans (IEPs) must adhere to the recommended modifications outlined in each individual plan.
GENERAL GOALS

The students will:

1. use Forensic Science to investigate real life issues.
2. develop scientific analysis skills through forensic investigations.
3. explore the use of scientific techniques and instrumentation to solve crimes.
4. integrate their prior scientific knowledge into a real life application.
5. distinguish between actual forensic application versus popular misconceptions.
GRADING PROCEDURES

MARKING PERIOD GRADES

Long and Short Term Assessments, which may include 90%
  • Tests, quizzes, and/or worksheets
  • Authentic assessments
  • Technology applications
  • Projects, reports, presentations
  • Laboratory investigations
  • Data Analysis
  • Analysis of assigned readings

Daily Assessments, which may include 10%
  • Active engagement in class activities
  • Demonstration of knowledge and understanding of course material
  • Skills and safety practices during lab investigations
  • Do Now/Exit Questions
  • Homework

Final Grade – Full Year Course

<table>
<thead>
<tr>
<th>Full Year Course</th>
<th>The midterm assessment will count as 10% of the final grade, and the final assessment will count as 10% of the final grade.</th>
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<tr>
<td>• Each marking period shall count as 20% of the final grade (80% total).</td>
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PARSIPPANY-TROY HILLS TOWNSHIP SCHOOLS
COURSE PROFICIENCIES

Course:  SCN320
Title:  FORENSICS

In accordance with district policy as mandated by the New Jersey Administrative Code and the NEW JERSEY STUDENT LEARNING STANDARDS, the following are proficiencies required for the successful completion of the above named course.

The student will:

1. distinguish between CSI perception and CSI reality (CSI effect).
2. understand the importance various roles play in solving a crime.
3. understand the role of the forensic scientist in solving a crime.
4. classify evidence based on its characteristics.
5. understand how Locard’s exchange principle relates to the transfer of evidence at a crime scene.
6. understand the importance of evidence based on evidential value.
7. identify and explain the procedures utilized in a crime scene investigation.
8. identify and examine various crime scenes to aid in reconstructing them.
9. identify the factors that influence eyewitness testimony.
10. describe the composition of human blood.
11. explain how the composition and characteristics of blood aide in the crime scene reconstruction.
12. explain the purpose of blood typing in a forensic investigation.
13. identify blood splatter patterns and calculate impact angles, points of convergence and origin for blood spatter.
14. explain and understand the biology of a fingerprint.
15. identify and classify fingerprints based on characteristics.
16. compare fingerprint samples to determine if a match is present.
17. use and demonstrate proper fingerprint collection techniques.
18. describe and explain how DNA is collected, analyzed and preserved from a crime scene.
19. explain the purpose of DNA evidence in identifying or clearing a suspect.
20. understand what classifies as trace evidence.
21. identify unknown samples of trace evidence.
22. understand proper procedure for collecting, mounting, and analyzing trace evidence.
23. identify synthetic versus natural fibers.
24. distinguish between various types of hair (i.e. animal versus human and arm hair versus eyelash).
25. identify different types of glass and analyze the differences between them.
26. utilize shatter patterns to reconstruct sequence of events and direction of impact.
27. determine the origins and composition of a given soil sample.
28. utilize ink chromatography to identify ink source/ writing instrument.
29. analyze handwriting samples to determine their source.
30. identify paper source using various samples.
31. describe the different types of impression evidence (footprints, tire treads, and tool marks) and how it is created.
32. describe how impression evidence is collected and analyzed in a forensic investigation.
33. explain the value of impression evidence in crime scene reconstruction.
34. identify and explain how specific bullets can be traced back to the firearm that fired it.
35. reconstruct vehicle collisions using velocity and momentum.
I. INTRODUCTION TO FORENSIC SCIENCE

Essential Question(s):

a) What is Forensic Science?
b) What is the role of a forensic scientist in solving a crime?
c) What is the difference between CSI perception and the CSI reality (CSI Effect)?

Enduring Understanding(s):

a) Forensic Science is the branch of Science that focuses on solving crimes to scientific analysis.
b) Forensic scientists analyze evidence in order to draw a conclusion, which they can testify to as an expert witness. The conclusions made by the forensic scientist can aid investigators in solving and prosecuting a case.
c) Forensic Science is the topic of many popular TV shows and movies; therefore, the general public does not realize the exact role of a forensic scientist and the process of investigation.

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<tr>
<th>PROFICIENCY / OBJECTIVE</th>
<th>Standards</th>
<th>SUGGESTED ACTIVITY</th>
<th>EVALUATION/ASSESSMENT</th>
<th>TEACHER NOTES</th>
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<tr>
<td>The student will be able to:</td>
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<tr>
<td>1. distinguish between CSI perception and CSI reality (CSI effect.)</td>
<td>WHST.9-12.7</td>
<td>• watch an episode of CSI and have students decide what is reasonable versus exaggeration and have group discussions about the &quot;CSI Effect&quot;.</td>
<td>Assessed for accuracy and understanding</td>
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<td>WHST.9-12.9</td>
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<td>SL.11-12.5</td>
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<td>MP.2</td>
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<td>8.1.12.D.5</td>
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<td>(NJCCCS TECH)</td>
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<tr>
<td>2. understand the importance various roles play in solving a crime.</td>
<td>WHST.9-12.7</td>
<td>• assign different roles in solving a crime to groups, have students research and present their role to the class.</td>
<td>Assessed for accuracy and understanding</td>
<td>Should include the connection between Forensic Science and the law</td>
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<td></td>
<td>WHST.9-12.9</td>
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<td>The student will be able to:</td>
<td>Students will:</td>
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<tr>
<td>3. understand the role of the forensic scientist in solving a crime.</td>
<td>WHST.9-12.7 WHST.9-12.9 8.1.12.F.1 (NJCCS TECH)</td>
<td>• read and interpret expert witness testimony in order to create a mock schedule (sequence of events) in order to draw a conclusion.</td>
<td>Assessed for accuracy and understanding</td>
<td>Should include expert testimony and the different roles forensic scientists have</td>
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II. EVIDENCE

Essential Question(s):

a) How is evidence classified?
b) What is the significance of Locard’s Exchange Principle for a forensic investigation?
c) What is evidential value?

Enduring Understanding(s):

a) Depending on the nature and characteristics of the particular item of evidence it can be classified as direct or indirect evidence, individual or class evidence, physical or biological evidence and/or reconstructive or associative evidence.

b) Locard’s Exchange Principle explains the transfer of material (evidence) from person, location and crime. It can be used to connect a person to a place(s) or crime scene.

c) Evidential value is determined based on the characteristics of the evidence. Evidence which is more common such as blue jean fibers is less significant that uncommon evidence.

EVIDENCE

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<td><strong>The student will be able to:</strong></td>
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<td>4. classify evidence based on its characteristics.</td>
<td>MP.2 RST.11-12.7</td>
<td>• work in small groups to classify evidence provided to them, then discuss the standard classifications and then have students reclassify.</td>
<td>Assessed for accuracy and understanding</td>
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<tr>
<td>5. understand how Locard’s Exchange Principle relates to the transfer of evidence at a crime scene.</td>
<td>MP.2</td>
<td>• use Glo-germ to demonstrate Locard's exchange principle. • bring in various samples of objects/fibers/materials and deduce something about the item’s past (i.e., cup that had coffee, beach bag with sand, etc.).</td>
<td>Assessed for accuracy and understanding</td>
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<td><strong>6. understand the importance of evidence based on evidential value.</strong></td>
<td>MP.2 RST.11-12.7 WHST.11-12.8 WHST.9-12.9</td>
<td>• rank possible evidence based on the probability that is significant. Research statistics to prove or disprove theories (i.e., blue jean fibers versus French silk fibers).</td>
<td>Assessed for accuracy and understanding</td>
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**III. CRIME SCENE INVESTIGATION**

**Essential Question(s):**
- a) How is a crime scene processed? What are the different roles in processing a crime scene?
- b) What is the significance of eyewitness testimony?

**Enduring Understanding(s):**
- a) Crime scenes are processed in a methodical and deliberate approach in order to minimize contamination and to ensure that nothing is overlooked. At a crime scene, the police/agents are responsible for protecting the crime scene and its integrity. The crime scene investigators (CSIs) who are either scientists or trained officers/agents are responsible for documenting and collecting the evidence from the scene of the crime.
- b) Eyewitness testimony can be unreliable and, therefore, should not be the only evidence in a crime investigation.

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**CRIME SCENE INVESTIGATION**

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| 7. identify and explain the procedures utilized in a crime scene investigation. | MP.2 | • participate in mini-lab activities in which proper evidence collection techniques are demonstrated.  
• process a mini-crime scene from start to signing over chain of custody. | Assessed for accuracy and understanding  
Teacher-generated rubric | Collecting evidence, documenting evidence, chain of custody, preserving evidence |
| 8. identify and examine various crime scenes to aid in reconstructing them. | WHST.11-12.8 | • sketch reconstructions of crime scenes based on crime scene measurements and facts and determine what other information is needed. | Assessed for accuracy and understanding | Primary versus secondary crime scene, crime scene reconstruction |
## CRIME SCENE INVESTIGATION

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<td>The student will be able to:</td>
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<td>9. identify the factors that influence eyewitness testimony.</td>
<td>MP.2 RST.11-12.7 WHST.11-12.8</td>
<td>• complete various activities that will test memories and eyes for detail to create a list of factors that influence eyewitness testimony.</td>
<td>Assessed for accuracy and understanding</td>
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IV. SEROLOGY/BLOOD EVIDENCE

Essential Question(s):

a) What is Serology and its significance to Forensic Science?
b) How is blood evidence analyzed?

Enduring Understanding(s):

a) Serology is the study of bodily fluids such as saliva and blood. Bodily fluids found at a crime scene can be used to link a person or a weapon to the crime, as well as collaborate a story.
b) Blood evidence can be tested chemically to determine blood type. Blood evidence can also be analyzed for spatter patterns, points of origin, and angles of impact.

### SEROLOGY/BLOOD EVIDENCE

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<td>The student will be able to:</td>
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<tr>
<td>10. describe the composition of human blood.</td>
<td>LS1.A</td>
<td>“create” blood using different materials which represent the different components of blood.</td>
<td>Assessed for accuracy and understanding</td>
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<tr>
<td>11. explain how the composition and characteristics of blood aide in the crime scene reconstruction.</td>
<td>LS1.A HS-LS1-2</td>
<td>Case Study: research and analyze famous cases with blood evidence and explain the importance of the blood evidence in reconstructing the crime scene.</td>
<td>Assessed for accuracy and understanding</td>
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<td>12. explain the purpose of blood typing in a forensic investigation.</td>
<td>WHST.9-12.2 WHST.9-12.7</td>
<td>Lab: Blood Typing</td>
<td>Assessed for accuracy and understanding</td>
<td>Ward’s Blood Typing Kit</td>
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Teacher-generated lab report rubric
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<th>EVALUATION/ ASSESSMENT</th>
<th>TEACHER NOTES</th>
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</table>
| 13. identify blood splatter patterns and calculate impact angles, points of convergence and origin for blood spatter. | MP.4  
HSN-Q.A.1-3 | • perform a lab in which they will drop simulated blood samples from different heights using physics to obtain data on speed and angle of spatter.                                                                 | Assessed for accuracy and understanding  
Teacher-generated Lab Report Rubric                                         | Simulated blood |
V. FINGERPRINTS

Essential Question(s):  
   a) What are fingerprints and their significance in a forensic investigation?  
   b) How are fingerprints collected and analyzed?

Enduring Understanding(s):  
   a) Fingerprints are formed by the layers of the skin and are a unique characteristic on all individuals. Fingerprints can be used to connect a person to a location or weapon, as well as used to identify a person.  
   b) Fingerprints are collected through the process of dusting and lifting. They are then analyzed based on the ridge patterns present. At larger facilities, computer software will initially “match” fingerprints, but then an examiner will compare all relevant prints to determine a “match”.

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<td>The student will be able to:</td>
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<td>14. explain and understand the biology of a fingerprint.</td>
<td>HS-LS-2</td>
<td>• create 3-D fingerprint models which include the different layers of the skin.</td>
<td>Assessed for accuracy and understanding</td>
<td></td>
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</table>
| 15. identify and classify fingerprints based on characteristics. | RST.11-12.1  
RST.11-12.8  
WHST.9-12.2 | • NOVA: participate in the “Hunt for the Serial Arsonist” activity. | Assessed for accuracy and understanding | Loop, Whorl, Arch Ridge characteristics |
| 16. compare fingerprint samples to determine if a match is present. | RST.11-12.8  
WHST.9-12.2 | • use the class set of fingerprint cards, to match fingerprint samples to a particular student. | Assessed for accuracy and understanding | |
### FINGERPRINTS

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<td>The student will be able to:</td>
<td>Students will:</td>
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<tr>
<td>17. use and demonstrate proper fingerprint collection techniques.</td>
<td>RST.11-12.8 WHST.9-12.2</td>
<td>• <strong>Fingerprint Lab</strong>: collect fingerprints from various surfaces (glass, paper, etc.) then use different techniques (dusting and chemical methods) to collect the prints.</td>
<td>Teacher-generated Rubric</td>
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VI. DNA

**Essential Question(s):**

a) What is DNA and how is it used in forensic investigations?

b) How is DNA collected and analyzed?

**Enduring Understanding(s):**

a) DNA contains the genetic information for a person. Since DNA is different for each individual, (except for identical twins) it can be used to connect a person to a location or weapon.

b) DNA is usually found in bodily fluids or hair samples which are connected at crime scene. The DNA samples are analyzed using a common four-step process: extraction, quantification, amplification, detection.

| DNA
| PROFICIENCY / OBJECTIVE | Standards | SUGGESTED ACTIVITY | EVALUATION/ ASSESSMENT | TEACHER NOTES |
|---|---|---|---|---|---|
| The student will be able to: | Students will: |
| 18. describe and explain how DNA is collected, analyzed and preserved from a crime scene. | HS-LS3-1 | NOVA: create a DNA Fingerprint Virtual Lab. | Assessed for accuracy and understanding | |
| 19. explain the purpose of DNA evidence in identifying or clearing a suspect. | HS-LS3-1 RST.11-12.1 RST.11-12.9 WHST.9-12.1 SL.11-12.5 | Case Study: research and analyze famous cases with DNA evidence and explain the importance of the DNA evidence in reconstructing the crime scene. | Assessed for accuracy and understanding | Teacher-generated rubric |
VII. TRACE

**Essential Question(s):**

a) What classifies as trace evidence?

b) Why is it important in a forensic investigation?

**Enduring Understanding(s):**

a) Trace evidence is materials left behind during a crime that is important to an investigation versus material that is not pertinent to the crime.

b) Trace evidence is evidence that can be transferred from one source to another during a crime; this can lead investigators to link aspects of an investigation.

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**TRACE**

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<td>The student will be able to:</td>
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<tr>
<td>20. understand what classifies as trace evidence.</td>
<td>WHST.9-12.9</td>
<td>• classify given pieces of evidence based on where they “think” it should go.</td>
<td>Assessed for accuracy and understanding</td>
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<tr>
<td>21. identify unknown samples of trace evidence.</td>
<td>SL.11-12.4 RST.11-12.9</td>
<td>• <strong>Trace Evidence Scavenger Hunt:</strong> be given a location and asked to identify and document trace evidence samples, then defend the evidence they would have collected.</td>
<td>Assessed for accuracy and understanding</td>
<td></td>
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<tr>
<td>22. understand proper procedure for collecting, mounting, and analyzing trace evidence.</td>
<td>WHST.9-12.7</td>
<td>• process a mini-crime scene for trace evidence and analyze.</td>
<td>Assessed for accuracy and understanding</td>
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Teacher-developed rubric
VIII. HAIR / FIBERS

**Essential Question(s):**

a) Why are hair and fibers important in forensic investigation?
b) What are the differences between synthetic and natural fibers?  
c) How can we distinguish between hairs from various sources, and why is this important?

**Enduring Understanding(s):**

a) Hair and fiber evidence can show links between different aspects of a crime.
b) Synthetic fibers are man-made, whereas natural fibers come from nature. Each type has varying characteristics.
c) Hairs from differing parts of the human body and from non-human sources have unique characteristics that make them identifiable. Identifying the source of the hair can aid investigators in solving a crime.

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<th>HAIR / FIBERS</th>
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<td><strong>PROFICIENCY / OBJECTIVE</strong></td>
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<tr>
<td>The student will be able to:</td>
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<td>23. identify synthetic versus natural fibers</td>
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<tr>
<td>24. distinguish between various types of hair (i.e., animal versus human and arm hair versus eyelash).</td>
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### IX. GLASS / SOIL

**Essential Question(s):**

a) Why are glass and soil samples important in a forensics investigation?
b) How do fracture patterns help to determine sequence of events?
c) How can soil evidence effect an investigation?

**Enduring Understanding(s):**

a) Glass and soil evidence can show links between different aspects of a crime.
b) Fracture patterns occur in a predictable order based upon direction of impact and sequence of events; by investigating the radial and conchoidal fractures the sequence of events can be determined.
c) Soil evidence can aid investigators by linking different aspects of a crime and by aiding in sequencing of events.

### HAIR / FIBERS

<table>
<thead>
<tr>
<th>PROFICIENCY / OBJECTIVE</th>
<th>Standards</th>
<th>SUGGESTED ACTIVITY</th>
<th>EVALUATION/ASSESSMENT</th>
<th>TEACHER NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>Students will:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>25. identify different types of glass and analyze the differences between them.</td>
<td>HS-PS4-1&lt;br&gt;MP.4&lt;br&gt;RST .11-12.7&lt;br&gt;8.2.12.F.2</td>
<td>• match up glass from different sources (i.e., tempered, window, drinking glass, etc.) from known sample.</td>
<td>Assessed for accuracy and understanding</td>
<td>Density, refractive index, becke line, color, chemical composition</td>
</tr>
<tr>
<td>26. utilize shatter patterns to reconstruct sequence of events and direction of impact.</td>
<td>HS-ETS1-1&lt;br&gt;HS-ETS1-2&lt;br&gt;RST .11-12.9&lt;br&gt;MP.4&lt;br&gt;8.1.12.A.1</td>
<td>• reconstruct a window using sugar glass.&lt;br&gt;• analyze a broken window pane and organize sequence of events.</td>
<td>Assessed for accuracy and understanding</td>
<td>Have pre-broken window, with tape or plexiglass to protect from sharp edges - radial fractures, conchoidal fractures</td>
</tr>
<tr>
<td>PROFICIENCY / OBJECTIVE</td>
<td>Standards</td>
<td>SUGGESTED ACTIVITY</td>
<td>EVALUATION/ASSESSMENT</td>
<td>TEACHER NOTES</td>
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<tr>
<td>The student will be able to:</td>
<td>Students will:</td>
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</tr>
<tr>
<td>27. determine the origins and composition of a given soil sample.</td>
<td>HS-ESS3-1</td>
<td>• collect soil samples, and map where they came from to determine “where” the given sample came from.</td>
<td>Assessed for accuracy and understanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RST.11-12.1</td>
<td>• work in groups to determine the origin of a sample based on provided lab data.</td>
<td></td>
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<tr>
<td></td>
<td>MP.2</td>
<td></td>
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<tr>
<td></td>
<td>HSS-IC.B.6</td>
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</tr>
</tbody>
</table>
X. QUESTIONED DOCUMENTS

Essential Question(s):

a) How are questioned documents important during a forensic investigation?
b) What different properties can be investigated to determine the source of a document?
c) What makes each handwriting sample unique?

Enduring Understanding(s):

a) Questioned documents can be used to indicate potential suspects in a forensic investigation.
b) Handwriting, ink composition, and paper source can all be used to determine the source of a document.
c) Handwriting samples are unique based upon variations specific to the writer and their environment, these include variations in letter size, slant, clarity, loops, closure, etc.

<table>
<thead>
<tr>
<th>PROFICIENCY / OBJECTIVE</th>
<th>Standards</th>
<th>SUGGESTED ACTIVITY</th>
<th>EVALUATION/ASSESSMENT</th>
<th>TEACHER NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
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</tr>
<tr>
<td>28. utilize ink chromatography to identify ink source/writing instrument.</td>
<td>HS-PS1-3 HS-PS2-6 WHST.9-12.2 WHST.9-12.7 MP.2</td>
<td>• <strong>Ink Chromatography Lab</strong>: use proper lab techniques to identify the writing instrument used in a given document.</td>
<td>Assessed for accuracy and understanding</td>
<td>TLC</td>
</tr>
<tr>
<td>29. analyze handwriting samples to determine their source.</td>
<td>HS-LS3-3 WHST.9-12.1 MP.2</td>
<td>• work in groups to identify “who” wrote a note based upon handwriting samples. • work in groups to research and present on a famous case involving document analysis.</td>
<td>Assessed for accuracy and understanding Teacher-developed rubric</td>
<td>Connections, slants, clarity, expansion, etc.</td>
</tr>
</tbody>
</table>
### QUESTIONED DOCUMENTS

<table>
<thead>
<tr>
<th>PROFICIENCY / OBJECTIVE</th>
<th>Standards</th>
<th>SUGGESTED ACTIVITY</th>
<th>EVALUATION/ ASSESSMENT</th>
<th>TEACHER NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>Students will:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 30. identify paper source using various samples. | WHST .9-12.7 | • make a pulp from various paper samples to compare to original.  
• students use watermarks and other identifying features to determine origin of sample. | Assessed for accuracy and understanding | Microscope, watermarks, pulp paper  
**Practical:** Students are given a “note” and must use ink chromatography, handwriting analysis, and paper analysis to determine source |
XI. **IMPRESSION EVIDENCE**

**Essential Question(s):**

a) How is impression evidence formed?

b) How is impression evidence collected and analyzed?

**Enduring Understanding(s):**

a) When a harder object comes in contact with a softer material, impression evidence is formed. Impression evidence can include tire tracks, shoeprints, bite marks, and tool marks.

b) After being photographed, a cast of the impressions evidence is formed using a material such as plaster.

---

**IMPRESSION EVIDENCE**

<table>
<thead>
<tr>
<th>PROFICIENCY / OBJECTIVE</th>
<th>Standards</th>
<th>SUGGESTED ACTIVITY</th>
<th>EVALUATION/ASSESSMENT</th>
<th>TEACHER NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td>Students will:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. describe the different types of impression evidence (footprints, tire treads, and tool marks) and how it is created.</td>
<td>• work in groups to create their own impression evidence in different mediums such as soil (wet and dry), sand, snow, etc. The students will use shoes, matchbox cars and different tools to create the impressions. The students will conclude what factors must be present to have impression evidence and what circumstances provide the most detailed and significant impression evidence.</td>
<td>Assessed for accuracy and understanding</td>
<td></td>
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</tr>
</tbody>
</table>
### IMPRESSION EVIDENCE

<table>
<thead>
<tr>
<th>PROFICIENCY / OBJECTIVE</th>
<th>Standards</th>
<th>SUGGESTED ACTIVITY</th>
<th>EVALUATION/ ASSESSMENT</th>
<th>TEACHER NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The student will be able to:</strong></td>
<td><strong>Students will:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. describe how impression evidence is collected and analyzed in a forensic investigation.</td>
<td>HS-PS-1</td>
<td>• create casts of footprints.</td>
<td>Assessed for accuracy and understanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WHST.11-12.8</td>
<td>• compare the casts to possible sources to draw a conclusion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. explain the value of impression evidence in crime scene reconstruction.</td>
<td>RST.11-12.1</td>
<td>• <strong>Case Study:</strong> research and analyze famous cases with impression evidence and explain the importance of the impression evidence in reconstructing the crime scene.</td>
<td>Teacher-generated rubric</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RST.11-12.7</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>WHST.9-12.7</td>
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<td></td>
<td>WHST.9-12.8</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>WHST.9-12.9</td>
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<tr>
<td></td>
<td>MP.2</td>
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</tbody>
</table>
XII. PHYSICS OF FORENSICS

Essential Question(s):

a) What aspects of Forensic Science are related to physics?
b) What is the significance for solving a crime?

Enduring Understanding(s):

a) Using physics, trajectories of projectiles can be calculated. Also, physics can be used to reconstruct crime scenes such as vehicle accidents to assist in solving a crime and corroborating a story.
b) Crime scenes can be reconstructed to corroborate witness testimony or assist investigators in solving the crime.

<table>
<thead>
<tr>
<th>PHYSICS OF FORENSICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFICIENCY / OBJECTIVE</td>
</tr>
<tr>
<td>The student will be able to:</td>
</tr>
</tbody>
</table>
| 34. identify and explain how specific bullets can be traced back to the firearm that fired it. | HS-PS2-6
HS-PS2-1
MP.4
HSN-Q-A.1 | • Training Lab: determine a Bullet’s Trajectory - use fake bullet holes, rulers, and string to determine a shooters height. | Assessed for accuracy and understanding | No real bullets are used, only mock bullet holes |
| 35. reconstruct vehicle collisions using velocity and momentum. | HS-PS2-2
MP.2
MP.4
HSN-Q-A.1 | • work in groups to reconstruct a vehicle accident based on a given set of parameters. Create a model of the accident and defend conclusions. | Assessed for accuracy and understanding |

**PHYSICS OF FORENSICS**

**PROFICIENCY / OBJECTIVE**

The student will be able to:

- Identify and explain how specific bullets can be traced back to the firearm that fired it.
- Reconstruct vehicle collisions using velocity and momentum.

**Standards**

- HS-PS2-6
- HS-PS2-1
- MP.4
- HSN-Q-A.1
- HS-PS2-2
- MP.2
- MP.4
- HSN-Q-A.1

**SUGGESTED ACTIVITY**

- Training Lab: determine a Bullet’s Trajectory - use fake bullet holes, rulers, and string to determine a shooters height.
- Work in groups to reconstruct a vehicle accident based on a given set of parameters. Create a model of the accident and defend conclusions.

**EVALUATION/ ASSESSMENT**

- Assessed for accuracy and understanding.

**TEACHER NOTES**

- No real bullets are used, only mock bullet holes.
BIBLIOGRAPHY

TEXTBOOK

WEBSITES
http://www.pbs.org/wgbh/nova/education/activities/2214_arsonist.html
http://www.pbs.org/wgbh/nova/education/body/create-dna-fingerprint.html
https://www.fbi.gov/about-us/cjis/fingerprints_biometrics/recording-legible-fingerprints/takingfps
https://www.fbi.gov/about-us/lab/biometric-analysis/codis
http://www.pbslearningmedia.org/search/?q=forensics
http://www2.rcscsd.org/forensics/files/L_07x01_Identification%20Of%20Fibers.pdf
http://www.njsp.org/divorg/invest/forensic-serology.html
http://www.handwritinginsights.com/terms.html
http://www.crimemuseum.org/crime-library/glass-analysis
APPENDIX A  SAMPLE AUTHENTIC ASSESSMENT
AUTHENTIC ASSESSMENT

CASE STUDY

You will be assigned a case to read and analyze for each unit of the course. As part of your analysis, you are to write a 1-2 page case study which includes the following information:

2. Identify and explain the significant evidence to the case
3. What is the significance of the case? How did the outcome impact the field of Forensic Science?

Use the rubric below to guide you.

<table>
<thead>
<tr>
<th>EXEMPLAR</th>
<th>SATISFACTORY</th>
<th>DEVELOPING</th>
<th>LIMITED</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION OF CRIME</td>
<td>● Description includes all relevant details (who, what, when, where, why and how) ● Uses descriptive phrases</td>
<td>● Description is lacking 1-2 small details</td>
<td>● Description is lacking major details ● Few details included</td>
</tr>
<tr>
<td>EVIDENCE OF CRIME</td>
<td>● Describes using detail the evidence which was important to the case ● Includes the significance of the evidence in solving the crime</td>
<td>● Description is lacking 1-2 small details ● Significance of evidence is loosely explained</td>
<td>● Description is lacking major details ● No significance explained</td>
</tr>
<tr>
<td>SIGNIFICANCE OF THE CASE</td>
<td>● Describes why the case is significant and how it impacted the field of Forensic Science</td>
<td>● Significance not fully explained ● Thoughts present but not fully communicated</td>
<td>● Significance loosely explained ● General</td>
</tr>
<tr>
<td>ORGANIZATION AND MECHANICS</td>
<td>● Organized well ● Easy to follow ● No errors in grammar and/or spelling</td>
<td>● Organized well ● Few Errors in grammar/spelling</td>
<td>● Loosely Organized ● Contains errors in grammar/spelling</td>
</tr>
</tbody>
</table>
APPENDIX B   LAB REPORT RUBRIC
# LAB REPORT RUBRIC

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>EXEMPLARY</th>
<th>SATISFACTORY</th>
<th>NEEDS IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXPERIMENTAL DESIGN</strong></td>
<td>Experimental design is a well-constructed test of the stated hypothesis.</td>
<td>Experimental design is structured to test the hypothesis. Minor details may be lacking, but do not affect the outcome.</td>
<td>Experimental design is not relevant to the hypothesis.</td>
</tr>
<tr>
<td><strong>PROCEDURES</strong></td>
<td>Procedures are listed in clear steps. Each step is numbered and is a complete sentence.</td>
<td>Procedures are listed in a logical order. Generally, steps are numbered and written in complete sentences.</td>
<td>Procedures do not accurately list the steps of the experiment.</td>
</tr>
<tr>
<td><strong>DATA COLLECTION</strong></td>
<td>Information is relevant to the objective and is carefully organized and presented in an appropriate table format. Table has appropriate title. Measurements are accurately reported. Correct SI units given.</td>
<td>Information is relevant to the objective and is presented in an organized way. Measurements may include minor inaccuracies that do not affect the outcome.</td>
<td>Information is incomplete, irrelevant, poorly organized or presented. Measurements are mostly inaccurate and no units are used.</td>
</tr>
<tr>
<td><strong>DATA PROCESSING AND PRESENTATION</strong></td>
<td>Calculations include formula, numbers with units, answers with units and proper number of significant digits (SD) using SI units and scientific notation. Graphs include title, variables with units, curve of best fitted (CBF). Helps math sequence with written explanation when necessary.</td>
<td>Graphs and calculations are accurate. Some of the required elements are loosely provided. Minor mistakes in measurements do not affect the outcome.</td>
<td>Graphs and/or calculations are incomplete, very inaccurate, and/or include major mistakes in measurement</td>
</tr>
<tr>
<td><strong>CONCLUSION AND EVALUATION</strong></td>
<td>Accurately explains results in detail using prior knowledge. Refers to the stated problem and is supported by evidence from the data/observations. Posed questions are answered appropriately. Fully evaluates investigative procedure and makes recommendations for future work.</td>
<td>Attempts to explain results using prior knowledge. Refers to the stated problem with some evidence from the data/observations. Posed questions are basically answered. Some evaluation of investigative procedure and/or recommendations for future work is provided.</td>
<td>Refers to the stated problem only. Posed questions are mentioned but not really answered. No evaluation of investigative procedure and/or recommendations for future work.</td>
</tr>
</tbody>
</table>
APPENDIX C  SAMPLE STUDENT ASSESSMENTS
PORTFOLIO AND SELF-ASSESSMENT INSTRUCTIONS FOR STUDENT WORKFOLDER

Three pieces from last year’s portfolio will be saved and kept in this year’s work folders. Choose these three (3) pieces based on the work you were most proud of, or that created a valuable learning experience.

A record log will be stapled inside of your work folder. You are to include the following every time we add content to the portfolio.

1. Date the assignment was completed
2. Type of assignment
3. Grade
4. Skills demonstrated by the work
5. Self-assessment

Type of Assignment
Quiz, test, lab, project, extra credit, homework, etc.

Skills Demonstrated
Science content knowledge, use of scientific method, laboratory skills, problem solving/critical thinking, writing skills, math skills, cooperative learning, graphing skills, ability to follow directions, etc.

Self-Assessment
Reaction to grade or feedback; quality of work, strengths, and weaknesses; “things I struggled with”; progress made; “what I would do differently to improve”; why this assignment is missing; plan for future assignments; etc.

At the end of every marking period, you are to write a self-reflection, commenting on your progress for the current marking period. Your work folder will then be reviewed for a quiz grade. Your grade will be based upon organization, inclusion of all relevant work, a completed log, and a thoughtful self-reflection.
WORK FOLDER REFLECTION

Look through the various items in your work folder and take a moment to think about this school year. Answer the following questions in the form of a paragraph to reflect on your progress so far this year.

• What were some of your goals in the beginning of this school year? Have you made progress towards achieving them?

• What are some goals you have for the rest of this school year?

• In what areas did you have the most success? Be specific by indicating the topics in which you feel most confident.

• In what areas did you have difficulty? What are some ways you can improve in those areas?

• Now that more than half of the year has passed, what are some things that you have learned that will help you next year? (e.g., study skills, putting more effort in homework, etc.)
WORK FOLDER LOG AND ASSESSMENT SHEET

Name: ___________________________________________________________ Marking Period: ________________________________

Title of Assessment: __________________________________________________________________________________________

Date: ________________ Grade Earned: ________________

Skills used on this assignment: __________________________________________________________________________________
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________

Explain how your level of preparation impacted your performance: ______________________________________________________
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________

Based on the specific teacher feedback given to you on this assignment, what could you do next time to improve the quality and content of your work? __________________________________________________________________________________
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________
APPENDIX D: NJSLS STANDARDS

3 - English Language Arts
4 - Mathematics
5 - Science
8 - Technology
9 - 21st Century Life and Careers
APPENDIX E: CURRICULUM MODIFICATIONS & ADAPTATIONS
There is no recipe for adapting general education curriculum to meet each student’s needs. Each teacher, each student, each classroom is unique and adaptations are specific to each situation.

Keep in mind that curriculum does not always need to be modified. By providing multi-level instruction you will find that adapting a lesson may not always be necessary. Differentiating instruction and providing multiple ways assess allows more flexibility for students to meet the standards and requirements of the class. At other times, the curriculum can be made more accessible through accommodations. In addition, supports for one student may not necessarily be the same in all situations, e.g., a student who needs full time support from a paraprofessional for math may only need natural supports from peers for English, and no support for art. And, supports should not be determined by the disability label, instead supports should be used when the instructional or social activity warrants the need for assistance. (Fisher and Frey, 2001).

The forms and examples on the following pages provide information about curriculum and types of adaptations that could be considered in developing the appropriate strategy for a particular student. Examples are provided for both elementary and secondary levels.
A Curricular Adaptation and Decision-making Process

This decision-making flowchart can be used to conceptualize the process of selecting and implementing curricular adaptations. It should be used as a tool for a team in determining an individual student's needs.

1. Identify the student's individual educational goals and objectives to be emphasized during general education activities.
2. Articulate the expectations for the student's performance in general education activities.
3. **Determine what to teach**
   - As a team, determine the content of the general education activity, theme or unit study.
4. **Determine how to teach**
   - As a team, determine if, without modification, the student can actively participate and achieve the same essential outcomes as non-disabled classmates. If the student cannot achieve the same outcomes...
5. **Select of design appropriate adaptations**
6. Select instructional arrangement
    - Select lesson format
    - Employ student-specific teaching strategies
    - Select curricular goals specific to the lesson
    - Engineer the physical and social classroom environment
    - Design modified materials
    - Select natural supports and supervision arrangements
8. If the above adaptation strategies are not effective, design an alternative activity.
A Curricular Adaptation and Decision-making Model

Examine the Structure of the Instruction

1. Can the student actively participate in the lesson without modification? Will the same essential outcome he achieved?
2. Can the student’s participation be increased by changing the instructional arrangement?
   - From traditional arrangements to:
     - Cooperative groups
     - Small groups
     - Peer partners
     - Peer or cross-age tutors
3. Can the student’s participation be increased by changing the lesson format?
   - Interdisciplinary/thematic units
   - Activity-based lessons, games, simulations, role-plays
   - Group investigation or discovery learning
   - Experiential lessons
   - Community-referenced lessons
4. Can the Student’s participation and understanding be increased by changing the delivery of instruction or teaching style?

Examine the Demands and Evaluation Criteria of the Task

5. Will the student need adapted curricular goals?
   - Adjust performance standards
   - Adjust pacing
   - Same content but less complex
   - Similar content with functional/direct applications
   - Adjust the evaluation criteria or system (grading)
   - Adjust management techniques

Examine the Learning Environment

6. Can the changes he made in the classroom environment or lesson location that will facilitate participation?
   - Environmental/physical arrangements
• Social rules
• Lesson location

**Examine the Materials for Learning**

7. Will different materials be needed to ensure participation?
   • Same content but variation in size, number, format
   • Additional or different materials/devices
   • Materials that allow a different mode of input
   • Materials that allow a different mode of output
   • Materials that reduce the level of abstraction of information

**Examine the Support Structure**

8. Will personal assistance be needed to ensure participation?
   • From peers or the general education instructor?
   • From the support facilitator’?
   • From therapists’?
   • From paraprofessionals?
   • From others?

**Arrange Alternative Activities that Foster Participation and Interaction**

9. Will a different activity need to be designed and offered for the student and a small group of peers?
   • In the classroom
   • In other general education environments
   • In community-based environments


## Curriculum Adaptations

It is important to correlate adaptations with the IEP. In other words, we are not adapting for adaptations sake but to meet the student’s needs as identified on an IEP.

### a. Curriculum as is.
This is the type we forget most frequently. We need to constantly be looking at the general education curriculum and asking if the students on IEPs may gain benefit from participating in the curriculum as is. We need to keep in mind that incidental learning does occur. Curriculum as is supports outcomes as identified in standard curriculum.

### b. Different objective within the same activity and curriculum.
The student with an IEP works with all the other students in the classroom participating in the activity when possible but, with a different learning objective from the other students. This is where the principle of partial participation fits. Examples include:

- A student with a short attention span staying on task for 5 minutes.
- Using a switch to activate a communication device to share during a class discussion.
- Expressing one’s thoughts by drawing in a journal instead of writing.
- Holding a book during reading time.
- Understanding the effect World War II has on the present rather than knowing the names and dates of key battles.

### c. Material or environmental adaptations.
The material or environmental changes are utilized so that participation in the general education curriculum by the student with the IEP may occur. Examples include:

- 5 spelling words from the weekly list instead of the standard 20.
- Completing a cooking assignment by following picture directions rather than written directions.
- Changing the grouping of the class from large group to small groups (possible with the additional support staff).
- Changing the instructional delivery from lecture to the cooperative learning format.
- Using a computer to write an assignment instead of paper and pencil.
- Reading a test to a student.
- Highlighting the important concepts in a textbook.
- Having the student listen to a taped textbook.
- Using enlarged print.
- Using an assistive technology device.
- Using visual cues such as picture and/or word schedules for those who have difficulty staying on task.
- Using a note taking guide listing the key concepts during a lecture.
d. Providing Physical assistance. Assistance from another person may be needed for a student to participate in a classroom activity. If possible, it is better to use natural supports (peers) as these will be the people always present in the student’s life. If the use of peers is not possible, then either the support teacher, the paraprofessional, the classroom teacher, the classroom aide, or a parent volunteer may provide the assistance. Most peers and staff will need training in the correct way of providing physical assistance. In addition, we need to keep in mind the principle of partial participations. Examples include:

- Starting a computer for an student with an IEP to use.
- Guiding a hand during handwriting.
- Assisting in activating a switch.
- Completing most of the steps of an activity and having a student with an IEP do the remainder.
- Pushing a student in a wheelchair to the next activity.

e. Alternative/substitute curriculum. This is sometimes referred to as functional curriculum as it usually involves the acquisition of “life skills.” The decision to use alternative/substitute curriculum is a major change and needs to be reflected on the IEP. This decision should be carefully made after weighing all of the pros and cons of using an alternative curriculum. The alternative curriculum may or may not take place in the general education classroom. Examples include:

- Community-based instruction (which all students may benefit from!)
- Learning job skills in the school cafeteria.
- Learning how to use a communication device.
- Doing laundry for the athletic department.
- Learning cooking/grooming skills at the home.

Overlap does occur among the five types of curriculum adaptations.

## Nine Types of Adoptions

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapt the way instruction is delivered to the learner.</td>
<td>Adapt how the learner can respond to instruction</td>
<td>Adapt the time allotted and allowed for learning, task completion or testing.</td>
</tr>
<tr>
<td><em>For example:</em> Use different visual aids; plan more concrete examples; provide hands-on activities; place students in cooperative groups.</td>
<td><em>For example:</em> Allow a verbal vs. written response; use a communication book for students; allow students to show knowledge with hands-on materials.</td>
<td><em>For example:</em> Individualize a timeline for completing a task; pace learning differently (increase or decrease) for some learners.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difficulty</th>
<th>Level of Support</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapt the skill level, problem type, or the rules on how the learner may approach the work.</td>
<td>Increase the amount of personal assistance with specific learner.</td>
<td>Adapt the number of items that the learner is expected to learn or compete.</td>
</tr>
<tr>
<td><em>For example:</em> Allow a calculator for math problems; simplify task directions; change rules to accommodate learner needs.</td>
<td><em>For example:</em> Assign peer buddies, teaching assistants, peer tutors or cross-age tutors.</td>
<td><em>For example:</em> Reduce the number of social studies terms a learner must learn at any one time.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of Participation</th>
<th>Alternate Goals</th>
<th>Substitute Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapt the extent to which a learner is actively involved in the task.</td>
<td>Adapt the goals or outcome expectations while using the same materials.</td>
<td>Provide the different instruction and materials to meet a learner’s individual goals.</td>
</tr>
<tr>
<td><em>For example:</em> In geography, have a student hold the globe, while others point out the locations.</td>
<td><em>For example:</em> In social studies, expect one student to be able to locate just the states while others learn to locate capitals as well.</td>
<td><em>For example:</em> Individualize a timeline for completing a task; pace learning differently (increase or decrease) for some learners.</td>
</tr>
</tbody>
</table>

---

Adaptations

Creating Ways to Adapt Familiar Lessons - Elementary

1. Select the subject area (and grade level) to be taught:
   reading  math  science  social studies  writing  music  health  P.E.  art
   Grade Level: ......................

2. Select the lesson topic to be taught (on one day):

3. Briefly identify the curricular goal for most learners: By the end of this class, most students will know
   ........................................................................................................................................................................

4. Briefly identify the instructional plan for most learners: As teacher, I will ..........................................................
   ........................................................................................................................................................................

5. Identify the name(s) of the learner(s) who will need adaptations in the curriculum or instructional plan:
   ........................................................................................................................................................................

6. Now use “Nine Types of Adaptations” as a means of thinking about some of the ways you could adapt what
   or how you teach to accommodate this learner in the classroom for this lesson.

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difficulty</th>
<th>Level of Support</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of Participation</th>
<th>Alternate Goal</th>
<th>Substitute Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
Creating Ways to Adapt Familiar Lessons - Elementary

1. Select the subject area (and grade level) to be taught:
   - Reading  math  science  social studies  writing  music  health  P.E.  art
   Grade Level: ...4...

2. Select the lesson topic to be taught (on one day): Vocabulary comprehension

3. Briefly identify the curricular goal for most learners: By the end of this class, most students will know ...the meaning of new vocabulary words from their story...

4. Briefly identify the instructional plan for most learners: As teacher, I will ask students to complete a matching activity in which they match words and definitions on paper. The students will also choose one word and write a sentence using the word on the bottom of their paper.

5. Identify the name(s) of the learner(s) who will need adaptations in the curriculum or instructional plan: Kim

6. Now use “Nine Types of Adaptations” as a means of thinking about some of the ways you could adapt what or how you teach to accommodate this learner in the classroom for this lesson.

<table>
<thead>
<tr>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place students in cooperative groups and divide the task between group members. Each member teaches their vocabulary work to team members.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow the student to record all or part of the assignment on tape.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask the student to complete the assignment at home and return it the next day.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select different vocabulary words for the student to learn; words that are less difficult or in some cases more difficult.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask a classmate, peer tutor or teaching assistant to assist in completing the assignment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select fewer (or more) words for the student to learn, but leave the assignment the same as for other students.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask the student to check classmates' definitions against as answer key.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternate Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set the goal as being to write the words only, or being able to pronounce the words, or just listening to the words and definitions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substitute Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose a different story for the student to read and identify one or several words the learner needs to know.</td>
</tr>
</tbody>
</table>

Center for School & Community Integration, Institute for the Study of Developmental Disabilities, Indiana University, Bloomington, IN
Creating Ways to Adapt Familiar Lessons - Secondary

1. Select the subject area (and grade level) to be taught:
   - math
   - science
   - history
   - literature
   - business
   - P.E.
   - fine arts
   - health

   Grade Level: ......................

2. Select the lesson topic to be taught (on one day):

3. Briefly identify the *curricular* goal for most learners: By the end of this class, most students will know .................................................................

4. Briefly identify the *instructional* plan for most learners: As teacher, I will .................................................................

5. Identify the name(s) of the learner(s) who will need adaptations in the curriculum or instructional plan:

6. Now use “Nine Types of Adaptations” as a means of thinking about some of the ways you could adapt what or how you teach to accommodate this learner in the classroom for this lesson.

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty</td>
<td>Level of Support</td>
<td>Size</td>
</tr>
<tr>
<td>Degree of Participation</td>
<td>Alternate Goal</td>
<td>Substitute Curriculum</td>
</tr>
</tbody>
</table>
SAMPLE FORM

Creating Ways to Adapt Familiar Lessons - Secondary

1. Select the subject area (and grade level) to be taught:
   math  science  history  literature  business  P.E.  fine arts  health
   Grade Level: 10

2. Select the lesson topic to be taught (on one day): Concept comprehension

3. Briefly identify the curricular goal for most learners: By the end of this class, most students will be able to define and explain the relevance of five concepts from their text chapter.

4. Briefly identify the instructional plan for most learners: As teacher, I will ask the students to read the chapter, identify five key concepts and write a short paragraph describing each concept they have chosen.

5. Identify the name(s) of the learner(s) who will need adaptations in the curriculum or instructional plan:
   John

6. Now use “Nine Types of Adaptations” as a means of thinking about some of the ways you could adapt what or how you teach to accommodate this learner in the classroom for this lesson.

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a review of the chapter prior to having the student complete the written work.</td>
<td>Allow the student to use a tape recorder to dictate the assignment instead of having to write the answers.</td>
<td>Allow the student an extra day to complete the task either in study hall or at home.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difficulty</th>
<th>Level of Support</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify the key concepts for the student but keep the remainder of the assignment the same.</td>
<td>Place the students in cooperative groups to complete this assignment. Group members can assist the student with reading or writing.</td>
<td>Select fewer or more concepts for the student to learn, but leave the assignment the same as for other students.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of Participation</th>
<th>Alternate Goal</th>
<th>Substitute Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask the student to pick out related books from the library that will provide supplementary information for classmates.</td>
<td>Set the goal as being to write the key concept words only, or being able to pronounce the words, or just listening to the words and descriptions.</td>
<td>During this lesson the student can work on keyboarding skills in the computer lab.</td>
</tr>
</tbody>
</table>

Center for School & Community Integration, Institute for the Study of Developmental Disabilities, Indiana University, Bloomington, IN
## Thematic Lesson Plan

<table>
<thead>
<tr>
<th>School Name</th>
<th>Class</th>
<th>Unit</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Room:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
</tr>
<tr>
<td>Grade:</td>
<td></td>
</tr>
<tr>
<td>Parent/Guardian:</td>
<td>Phone:</td>
</tr>
<tr>
<td>Classroom Teacher:</td>
<td></td>
</tr>
<tr>
<td>Inclusion Support Teacher:</td>
<td></td>
</tr>
</tbody>
</table>

**Major standards, objectives and expectations for the unit**

<table>
<thead>
<tr>
<th>Materials, books, media, worksheets, software, etc.</th>
<th>Items requiring accommodations and/or modifications</th>
</tr>
</thead>
</table>

**Instructional arrangements. Time and opportunities for large group, small group, core group, learning centers, individual activities, non-classroom instruction. Does it change day to day? Explain:**

<table>
<thead>
<tr>
<th>Projects, supplemental activities, and homework</th>
<th>Items requiring accommodations and/or modifications</th>
</tr>
</thead>
</table>

| Assessment(s) and final products. Summarize actual student performance (attach examples as appropriate) on the reverse. | Items requiring accommodations and/or modifications |

PEAK Parent Center, Inc. 1999
### Thematic Lesson Plan

**School Name:** Palm View Elementary  
**Class:** Social Studies  
**Unit:** More Alike Than Different  
**Room:** 21

**Student Name:** Corey Santos  
**Age:** 8  
**Grade:** 2  
**Parent/Guardian:** Ms. Anita Santos  
**Phone:** 555-5432  
**Classroom Teacher:** Mr. Sean Garrett  
**Inclusion Support Teacher:** Ms. Tangela Hunter

#### Major Standards, Objectives and Expectations for the Unit
1. Understand why personal and civic responsibility are important.
2. Understand the cultural traditions and contributions of various societies and groups.
3. Display appreciation of diversity in our society, including cultural, gender, and ability.

#### Materials, Books, Media, Worksheets, Software, etc.
1. Children's books on topic
2. "Chocolates" (Activities for a Diverse Classroom)
3. Family interview questions
4. Slides and overheads

#### Instructional Arrangements, Time and Opportunities for Large Group, Small Group, Core Group, Learning Centers, Individual Activities, Non-Instructional Instruction, Does It Change Day to Day? Explain.
1. Large group for read aloud
2. Interactive lessons using various media
3. Cooperative groups to complete Hyperstudio project
4. Small group for chocolate activity

#### Projects, Supplemental Activities, and Homework
1. "Box of Chocolates" (Activities for a Diverse Classroom)
2. Hyperstudio group project: Are We More Alike Than Different?
3. Homework - Family interview

#### Assessment(s) and Final Products
- Summarizes actual student performance (attach examples as appropriate) on the reverse.
- Completion of group activities
- Rubric for Hyperstudio presentation
- Family interview

#### Items requiring accommodations and/or modifications
1. Some books on tape
2. Highlighter posterboard
3. Fewer questions - done on audio tape
4. Modify if necessary
5. Paraprofessional assistance with computer
6. Highlight posterboard of key points
7. Select task items as student's instructional level
8. Provide word bank or magazine pictures

#### Items requiring accommodations and/or modifications
1. Assess on use of language
2. Modify rubric

---

PEAK Parent Center, Inc. 1999
**Thematic Lesson Plan**

**School Name:** Palm View Elementary  
**Class:** Language Arts  
**Unit:** One Book, Two Book, Red Book, Blue Book: Author Study of Dr. Seuss

**Student Name:** Corey Santos  
**Age:** 8  
**Grade:** 2  
**Parent/Guardian:** Ms. Anita Santos  
**Phone:** 555-5432  
**Classroom Teacher:** Mr. Sean Garrett  
**Inclusion Support Teacher:** Ms. Tanglea Hunter

**Room:** 21

**Major standards, objectives and expectations for the unit:**
1. Increase comprehension by rereading, retelling, and discussion.
2. Determine the main idea in nonprint communication.
3. Write, question, and make observations about familiar topics, stories, and new experiences.
4. Recognize personal preferences in literature.

**Materials, books, media, worksheets, software, etc.:**
1. Dr. Suess books;  
2. Formatted reflective journal;  
3. Summary sheet to be completed on each book;  
4. Family response journal (homework);  
5. Video versions of Dr. Suess books;  
6. Computer-Clarisworks program;  
7. Biographical source materials

**Items requiring accommodations and/or modifications:**
2. Pictures available for use in journal  
6. Picture vocabulary writing program  
7. Taped readings of source material

**Instructional arrangements, time and opportunities for large group, small group, large group learning centers, individual activities, non-classroom instruction.**
Does it change day to day? Explain:

1. Large group for K-W-L chart;  
2. Large group read aloud;  
3. Read-Writer-pair-share;  
4. Individual journal writing;  
5. Partner research in media center;  
6. Concept web of themes;  
7. Small group editing

**Projects, supplemental activities, and homework:**
1. Read 2 books-parents and child write in response journal (homework);  
2. Choose 4 books from list (one must be a video), analyze for common themes;  
3. Analyze for a kindergarten, then read aloud to him or her

**Assessment(s) and final products:**
Summarize actual student performance (attach examples as appropriate) on the reverse.

1. Reflective journal entries  
2. Author project rubric of presentation  
3. Self-assessment of kindergarten reading  
4. Portfolio selection

**Items requiring accommodations and/or modifications:**
2. Reduce rubric to focus on thematic analysis  
3. Use pictures to support self-assessment
# SAMPLE FORM  (Secondary)

## Academic Unit Lesson Plan

<table>
<thead>
<tr>
<th>School Name</th>
<th>Class</th>
<th>Unit</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Class Schedule:</th>
<th>Room:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td>Phone:</td>
<td></td>
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<tr>
<td>Grade:</td>
<td></td>
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<tr>
<td>Parent/Guardian:</td>
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<tr>
<td>Advocate Teacher:</td>
<td></td>
<td></td>
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<tr>
<td>Classroom Teacher:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Major standards, objectives and expectations for the unit

### Materials, books, media, worksheets, software, etc.

### Instructional arrangements. Time and opportunities for large group, small group, core group, learning centers, individual activities, non-classroom instruction. Does it change day to day? Explain:

### Projects, supplemental activities, and homework

### Assessment(s) and final products. Summarize actual student performance (attach examples as appropriate) on the reverse.

### Items requiring adaptations and/or modifications

---

PEAK Parent Center, Inc. 1999
### Academic Unit Lesson Plan

**School Name:** Central  
**Class:** Biology  
**Unit:** The Cell

#### Student Name: Kelley Glass
- **Age:** 15
- **Grade:** 10
- **Parent/Guardian:** Ms. Rebecca Glass  
  **Phone:** 555-1212
- **Advocate Teacher:** Mr. David Porter
- **Classroom Teacher:** Ms. Janita Foutch

#### Class Schedule:
- **Block 1:** Math  
  **Room:** 22
- **Block 2:** English  
  **Room:** 147
- **Block 3:** Biology  
  **Room:** 150
- **Block 4:** World Geography  
  **Room:** 150
- **Block 5:** 3-D Art  
  **Room:** 17

#### Major Standards, Objectives and Expectations for the Unit
1. Students will understand the structure and function of the cell.
2. Students will identify the parts of the cell.
3. Students will identify how cells are organized in multi-cellular organisms.

#### Materials, Books, Media, Workbooks, Software, etc.
1. Book: *Modern Biology*
2. Educational videotapes related to chapter contents
3. Art supplies for Cell projects
4. Chapter worksheets
5. Primary source: Science magazine article on the cell
6. Local biology professor to discuss current research on cells

#### Instructional Arrangements: Time and Opportunities for Large Group, Small Group, Circle, Group Learning Centers, Individual Activities, Non-Classroom Instruction. Does it change day to day? Explain.
1. Large group instruction with overheads to introduce the cell
2. Small groups to complete labs, worksheets, mind map, and chapter review
3. Two cell labs will be completed in partners (onion skin & Jell-O)
4. Individual time to complete illustrated vocabulary

#### Projects, Supplemental Activities, and Homework
1. **Homework:** Complete vocabulary, bring in Jell-O cell food items
2. "Design a cell" and "Parts of the cell" group projects & presentations
3. Write-up for each completed lab with illustrations

#### Assessment(s) and Final Products. Summarize actual student performance (attach examples as appropriate) on the reverse.
1. Add illustrated vocabulary words to class portfolio
2. Culminating activity: "Design a cell" and "Parts of the cell" projects
3. Chapter test

#### Items requiring adaptations and/or modifications
1. Order textbook from publisher on cassette.
2. Modify worksheets to emphasize key points of chapters.
3. Record science magazine article on audio tape.
4. Copy of teacher's overhead transparencies given to student.
5. Peer takes notes and highlights key points; student types on to computer for both.

#### Items requiring adaptations and/or modifications
1. Magazine pictures to illustrate the meaning of vocabulary words
2. Labs write-up sheet completed with peer using computer graphics & illustrations to supplement write-up
3. Chapter test read orally with additional time given, reducing the number of options for multiple choice questions to focus on major concepts, and providing options for short answer questions.

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PEAK Parent Center, Inc. 1999
# SAMPLE FORM

(Example for student Kelley Glass)

<table>
<thead>
<tr>
<th>School Name: Central</th>
<th>Class Schedule:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Block 1: Math</td>
</tr>
<tr>
<td></td>
<td>Block 2: English</td>
</tr>
<tr>
<td></td>
<td>Block 3: Biology</td>
</tr>
<tr>
<td></td>
<td>Block 4: World Geography</td>
</tr>
<tr>
<td></td>
<td>Block 5: 3-D Art</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Name: Kelley Glass</th>
<th>Room:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: 15</td>
<td>22</td>
</tr>
<tr>
<td>Grade: 10</td>
<td>147</td>
</tr>
<tr>
<td>Parent/Guardian: Ms. Rebecca Glass Phone: 555-1212</td>
<td></td>
</tr>
<tr>
<td>Advocate Teacher: Mr. David Porter</td>
<td></td>
</tr>
<tr>
<td>Classroom Teacher: Mr. Scott Moore</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major standards, objectives and expectations for the unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students will evaluate their beliefs related to prejudice and diversity.</td>
</tr>
<tr>
<td>2. Students will learn about the plight of the migrant farm worker.</td>
</tr>
<tr>
<td>3. Students will learn about the times during the Depression and the time period in which Steinbeck lived his writing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials, books, media, worksheets, software, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Copy of the short story &quot;The Circuit&quot; by Francisco Saverio</td>
</tr>
<tr>
<td>2. Copy of the novel &quot;Of Mice and Men&quot; by John Steinbeck</td>
</tr>
<tr>
<td>3. Worksheets for each of the six chapters</td>
</tr>
<tr>
<td>4. Video of the book &quot;Of Mice and Men&quot;</td>
</tr>
<tr>
<td>5. Video camera</td>
</tr>
<tr>
<td>6. &quot;I Am&quot; Poem to use with &quot;The Circuit&quot;</td>
</tr>
<tr>
<td>7. &quot;Open Mind&quot; worksheet (see activity under Projects)</td>
</tr>
<tr>
<td>8. Circle of Friends worksheet (see activity under Projects)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items requiring adaptations and/or modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Audio/visual recorder of the short story &quot;The Circuit&quot;</td>
</tr>
<tr>
<td>2. Audio/visual recorder of the novel &quot;Of Mice and Men&quot;</td>
</tr>
<tr>
<td>3. Reformatted chapter summary worksheets and comprehension questions using outlines, pictures, or yes/no format</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructional arrangements: Time and opportunities for large group, small group, group, group, learning centers, individual activities, non-classroom instruction. Does it change day to day? Explode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Large group instruction for introduction of the time period, Steinbeck, the Depression and migrant farm workers: use of opening question in Socratic dialogue format: Am I my brother's keeper?</td>
</tr>
<tr>
<td>2. Small groups for &quot;I Am&quot; poem for &quot;The Circuit&quot;</td>
</tr>
<tr>
<td>3. Student pairs to complete worksheets</td>
</tr>
<tr>
<td>4. Large group presentation for trial for George (with every student having a part in the trial)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projects, supplemental activities, and homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Class completes chapter worksheets</td>
</tr>
<tr>
<td>2. &quot;I Am&quot; poem on short story &quot;The Circuit&quot; Students complete outline of poem, format that includes descriptive phrases, parallel structure within lines, and constructive thinking</td>
</tr>
<tr>
<td>3. Simulated trial of George for killing Lennie</td>
</tr>
<tr>
<td>4. Handbook: rehearse roles in trial, some reading of novel at home</td>
</tr>
<tr>
<td>5. Illustation: vocabulary words</td>
</tr>
<tr>
<td>6. &quot;Open Mind&quot; activity students fill in thoughts from the perspective of specified characters</td>
</tr>
<tr>
<td>7. Circle of Friends activity students complete circular diagram to identify their relationships with family and friends; students complete similar diagram for Lennie's character (from &quot;Of Mice and Men&quot;)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items requiring adaptations and/or modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reformatted worksheets completed on the computer with the peer tutor</td>
</tr>
<tr>
<td>2. Give options for responses for completing poem (3 choices for each line of the poem)</td>
</tr>
<tr>
<td>3. Listen to audio/visual recordings and/or family members read book</td>
</tr>
<tr>
<td>4. Rehearse part in play with pictures and music</td>
</tr>
<tr>
<td>5. Word bank for use completing &quot;Open Mind&quot; activity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment(s) and final products: Summarize actual student performance (attach examples as appropriate) on the reverse.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trial presentation/video taped</td>
</tr>
<tr>
<td>2. Objective test</td>
</tr>
<tr>
<td>3. Evaluative essay</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items requiring adaptations and/or modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Test read orally to student by peer tutor. Choices for answers are limited in number</td>
</tr>
<tr>
<td>3. With assistance from peer, complete the essay outline using computer. Create a pictorial collage to represent the themes of each section of the outline</td>
</tr>
</tbody>
</table>

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