Controlled Substances

Course
Forensic Science

Unit XII
Controlled Substances

Essential Question
What is a drug? What is the difference between an illicit drug and a controlled substance?

TEKS
§130.295(c)
(1)(A)(B)
(2)(F)(G)(H)
(3)(A–F)
(6)(A–D)(G)(H)
(13)(A)(B)

Prior Student Learning
Physical and chemical properties of compounds

Estimated Time
4 ½ hours total
- *45 min. Engage Activity*
- *2¼ hr. lecture*
- *45 min. White Powder Lab*
- *45 min. assessment*

Rationale
The term "drug" can have different meanings to different people. To some, drugs are a means of escaping the pressures of life; to others, they are a necessity for prolonging health and life; and to yet others, they are a means of ending it. This unit will identify and categorize controlled substances and common drugs, and show how forensic science is used to fight crimes of this type.

Objectives
The student will be able to:
1. Compare the types of drug dependence.
2. Characterize types of drugs.
3. Differentiate between screening and confirmation tests for drugs.
4. Identify proper collection and preservation methods for drug evidence.

Engage
Do an Internet search for the following news report: DEA Announces Emergency Ban on 'Bath Salts'. Watch the news report and use the following questions for a class discussion. Use the Discussion Rubric for assessment. *(Note: this activity may be adapted into a debate, and the Debate Rubric may be used for assessment).*
- What are the dangers of this new "legal" drug that is sweeping the country?
- In your opinion, will it become illegal to sell or purchase?
- In the video, there is an interview with a gentleman who owns several of the stores that sell the drug. What is your opinion of his statements?

Key Points
I. Drug Dependence
   A. A drug is a natural or synthetic substance that is used to produce physiological or psychological effects; an illicit drug is a substance considered to be illegal
   B. Controlled substances are those that can only be administered with a doctor's prescription
   C. Psychological Dependence
      1. The conditional use of a drug caused by underlying emotional and/or psychological needs
      2. Psychological needs can come from numerous social and personal factors that increase an individual's desire to escape from reality and/or for a sense of well-being
      3. The intensity of dependence depends upon the nature of the drug used
      4. The desire for emotional well-being is the main motive leading to repeated use and intensive drug abuse

D. Physical Dependence
    1. Physiological need for a drug is
        a) Caused by its regular use
        b) Characterized by withdrawal sickness when the drug stops being administered
    2. Some of the more widely used drugs have little potential for physiological dependence
    3. Physiological dependence develops when the user has a regular schedule of drug intake
E. Social Aspects of Dependence
    1. The more occupied users become in their daily lives with using, the more they will neglect their individual and social responsibilities, such as personal hygiene or maintaining a job

II. Types of Drugs
A. Narcotic
    1. A drug that induces sleep and depresses vital body functions such as blood pressure, pulse, and breathing
    2. Society inappropriately classifies a narcotic as any drug that is socially unacceptable
    3. Opiates come from the Asian poppy
        a) Include heroin, morphine, and codeine
        b) Considered analgesics (substances that lessen or eliminate pain)
    4. Synthetic opiates
        a) Not naturally derived from opium, but have similar effects
        b) Methadone
            (1) Pharmacologically related to heroin
            (2) Administered to heroin addicts when it was found to eliminate the addicts' desire for heroin with minimal side effects
        c) Oxycodone
            (1) Closely related to morphine and heroin
            (2) Prescribed by doctors for chronic pain
B. Hallucinogens
    1. Drugs that can cause alterations in normal thought processes, perceptions, and moods
    2. Marijuana
        a) Qualifies as the most widely used illicit drug in the U.S.
        b) Derived from the cannabis plant
        c) Leaves, flowers, stems, and seeds are mixed in varying proportions
        d) Contains tetrahydrocannabinol (THC)
        e) Has potential medical uses
            (1) Reduces eye pressure in glaucoma patients
            (2) Lessens nausea caused by anticancer drugs

3. Other hallucinogens
    a) Psilocybin (mushrooms)
    b) LSD (lysergic acid)
    c) PCP (phencyclidine)

C. Depressants
1. Drugs that slow, or depress, the central nervous system (CNS)
2. Alcohol
    a) With more production and more consumers, alcohol is unquestionably the most widely used and abused drug
    b) Effects range from inhibited judgment and concentration in low doses to extreme irritability or even coma, and possibly death in extreme doses
3. Barbiturates
    a) Commonly known as “downers” because they relax the user and may produce sleep
    b) Some examples that are commonly used in medicinal practices are
        (1) Amobarbital
        (2) Secobarbital
        (3) Phenobarbital
    c) Methaqualone is an illicit barbiturate
4. Antipsychotics and anti-anxiety drugs
    a) Produce tranquility without altering higher level thinking faculties
    b) Some examples that are commonly prescribed to deal with everyday tensions are
        (1) Meprobamate
        (2) Chlordiazepoxide
        (3) Diazepam
5. Huffing/Inhalants
    a) Sniffing volatile solvents such as model cement, glues, and cleaners
    b) Inhaling aerosol propellants such as spray paint and refrigerant
    c) Produces feelings of exhilaration and euphoria, then drowsiness and stupor

D. Stimulants
1. Stimulate, or speed up, the CNS
2. Amphetamines
    a) Known as “uppers,” or “speed”
    b) Produce increased alertness and feelings of well-being, followed by a decrease in fatigue and loss of appetite. These effects are accompanied by restlessness, instability, and oftentimes depression
3. Cocaine
    a) Comes from the “coca” plant in tropical Asia and South

America
b) Has effects similar to amphetamines
c) Found in powder form, or “cooked” to its freebase form, known as crack
d) It is very difficult to overcome addiction to this drug

E. Club Drugs
1. Synthetic drugs that are often used at nightclubs, raves (all night dance parties), and bars; they are used as a way to stimulate the “rave” experience
2. GHB and Flunitrazepam (aka “Roofies”) are CNS depressants often associated with drug-facilitated sexual assaults, rapes, and robberies
a) GHB can produce dizziness, sedation, muscle relaxation, and increased libido
b) Flunitrazepam can produce loss of consciousness and an inability to remember what happened during the hours after ingestion
3. Methylenedioxymethamphetamine (aka MDMA or Ecstasy)
a) Is a mind altering drug that has hallucinogenic effects
b) Chronic use can cause body system breakdown, severe brain damage, memory loss, and seizures
4. Ketamine (aka Special K)
a) Is an animal anesthetic used by veterinarians
b) However, when it is used on humans, it causes feelings of euphoria, visual hallucinations, impaired motor function, and amnesia

F. Anabolic Steroids
1. Chemically related to the male sex hormone, testosterone, that develops secondary male characteristics (androgenic effects) and accelerates muscle growth (anabolic effects)
2. Often used by athletes, from amateur to professional
3. Side effects include liver malfunction, cancer, masculinizing effects in females, diminished sex drive in males, unpredictable moods, personality changes, and depression

III. Drug Control Laws
A. There are varying levels and penalties based on manufacture, distribution, possession, or use of a drug as well as the drug’s weight, type, and concentration
B. The Controlled Substances Act – the federal law that establishes five classifications of controlled dangerous substances on the basis of each drug’s potential abuse, potential for physical and psychological dependence, and medical value; the U.S. Attorney General has the authority to add, delete, or reschedule a drug as needed
1. Schedule I
a) High potential for abuse and no currently accepted medical

use in the U.S.
b) Examples: heroin, marijuana, methaqualone, LSD

2. Schedule II
   a) High potential for abuse, currently accepted medical use with severe restrictions, potential for severe physiological and psychological dependence
   b) Examples: opium and its derivatives, cocaine, methadone, PCP, most amphetamine preparations, most barbiturate preparations, and dronabinol (the synthetic equivalent of marijuana, prescribed for medical use)
3. Schedule III
   a) Less potential for abuse, currently accepted medical use, potential for low to moderate physiological and high psychological dependence
   b) All barbiturates not included in Schedule II, such as codeine preparations and anabolic steroids
4. Schedule IV
   a) Low potential for abuse, current medical use, limited dependence related to Schedule III
   b) Example: tranquilizers
5. Schedule V
   a) Low abuse, medical use, less potential for dependence than Schedule IV
   b) Non-narcotic medicinal ingredients and some opiate drug mixtures

C. Criminal penalties under the Act
1. The most severe penalties are associated with Schedule I and II
2. The Controlled Substance Act controls substances such as analogs and designer drugs that are chemically similar or related to controlled substances
3. Regulates the manufacture and distribution of precursors which are the chemical compounds used by clandestine labs to synthesize drugs

IV. Forensic Drug Analysis

A. Screening and Confirmation
1. Screening test – a preliminary test used to reduce the number of possible identities of an unknown substance
2. Confirmatory test – a single test that specifically identifies a substance
3. Color test – drugs yield characteristic colors when mixed with certain chemicals
   a) Marquis – turns purple with heroin, morphine, and most opium derivatives; it turns orange/brown with amphetamines and methamphetamines
   b) Dillie-Koppanyi – turns violet-blue with barbiturates

c) Duquenois-Levine – turns purple with marijuana (with chloroform)
d) Van Urk – turns blue-purple with LSD
e) Scott Test – turns blue with cocaine (after a series of steps)

4. Microcrystalline Test
   a) More specific than a color test
   b) Identifies a substance based on the color and shape of crystals formed when the substance is mixed with specific reagents
5. Chromatography
   a) Separates complex mixtures into specific components by attraction to a stationary phase while being propelled by a moving phase
   b) Thin Layer Chromatography uses a solid stationary phase and a moving liquid phase; can be used to compare an unknown sample with known samples
   c) Gas Chromatography uses a stationary liquid phase and a moving gas phase (called a carrier gas) which flows through a stainless steel or glass column
      (1) Components separate by moving through the column at different rates
      (2) The retention time is how long it takes for a component to emerge from the column; the retention times of known and unknown substances can be compared
6. Spectrophotometry exposes substances to electromagnetic radiation
   a) UV and Visible Spectrophotometry measures and records absorbance of UV and visible light as a function of wavelength or frequency
   b) Infrared Spectrophotometry is similar to UV, but because absorption bands are so numerous, it is far more capable of identifying a substance specifically
7. Mass Spectrometry
   a) Gas chromatography is one of the most important measurements in a crime lab, but it cannot always produce specific identification. However, when it is coupled with mass spectrometry, the problem is overcome
   b) A mixture's components are first separated with gas chromatography which is sensitive to minute amounts
   c) With data obtained from gas chromatography and mass spectrometry, an analyst can separate components of a complex drug mixture and identify each substance present

V. Collection and Preservation of Drug Evidence
   A. Packages must prevent loss and cross-contamination of evidence
   B. If it is a volatile solvent (glue sniffing compounds), it must be in an

airtight container to prevent evaporation
C. Mark with information to ensure identification by the officer and maintain a chain of custody
D. Investigator should provide any background information of the drug's identification, such as the screening tests, to the lab analyst

Activities
Analysis of White Powders Lab. Have students simulate drug testing in a lab. Use common white powders to represent controlled substances. Have them test samples (known and unknown), review their physical and chemical properties, and analyze the results. Use the Analysis of White Powders Lab handout for the activity and the Analysis of White Powders Teacher's Notes and Key for assessment.

Assessments
Controlled Substances Exam and Key
Discussion Rubric
Individual Work Rubric
Presentation Rubric

Materials
Controlled Substances computer-based presentation
Presentation materials or computer-based presentation software
Analysis of White Powders Lab (Note: refer to the lab handout for the amounts; the amounts needed are based on student lab groups, and the number of groups depends on the class size.)
- Analysis of White Powders Lab handout
- Analysis of White Powders Teacher's Notes and Key
- Popcorn salt
- Powdered (confectioner's) sugar
- Starch
- Baking soda
- Plaster (of Paris)
- Vinegar in a dropper bottle
- Iodine in a dropper bottle
- Distilled water in a dropper bottle
- Petri dishes (tops and bottoms)
- Plastic spoons
- Grease pencil
- Toothpicks
- Magnifying glasses
- Gloves
- Safety goggles

Resources

Saferstein, Richard. *Forensic Science: An Introduction.* New Jersey: Pearson Prentice Hall, 2008
Saferstein, Richard. *Forensic Science: An Introduction.* 2nd ed. New Jersey: Pearson Prentice Hall, 2011
Saferstein, Richard. *Criminalistics: An Introduction to Forensic Science.* 8th ed. Upper Saddle River, NJ; Pearson Prentice Hall, 2004
Do an Internet search for the following: DEA Announces Emergency Ban on 'Bath Salts'

Accommodations for Learning Differences
For reinforcement, students should research the drug nicotine, found in cigarettes. After understanding the type of drug and its effects, compare those to the characteristics of each of the five schedules of drugs to determine under which schedule it would fall. Use the Individual Work Rubric for assessment.

For enrichment, students will go back to the Engage Activity of this unit. Allow students to research more on the topic of bath salts. Explain the following scenario: "Let's pretend that bath salts immediately become an illicit drug here in the US. It is your job to create a campaign poster or a computer-based presentation to warn the public about the dangers and seriousness of the drug. Present your poster or campaign to the public (class)." Use the Presentation Rubric for assessment.

State Education Standards
Texas Essential Knowledge and Skills for Career and Technical Education
§130.295. Forensic Science (One Credit).

(1) The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:
  (A) demonstrate safe practices during laboratory and field investigations; and
  (B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.
(2) The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to:
  (F) collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides,

stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, meter sticks, and models, diagrams, or samples of biological specimens or structures;

(G) analyze, evaluate, make inferences, and predict trends from data; and

(H) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.

(3) The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:

(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;

(B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;

(C) draw inferences based on data related to promotional materials for products and services;

(D) evaluate the impact of scientific research on society and the environment;

(E) evaluate models according to their limitations in representing biological objects or events; and

(F) research and describe the history of science and contributions of scientists.

(6) The student analyzes the evidence collected from a crime scene using scientific methods. The student is expected to:

(A) demonstrate conversions of measurements between English and International System (SI) of units;

(B) distinguish between physical and chemical properties of matter using the periodic table;

(C) determine the elements within a compound or mixture;

(D) identify the four types of chemical reactions;

(G) identify the light sources used in forensic science such as ultraviolet light;

(H) explain the examination of trace evidence using instruments such as a spectrophotometer, stereoscope, electron microscope, and compound microscope;

(13) The student identifies drugs found at a simulated crime scene. The student is expected to:

(A) classify controlled substances using Food and Drug Administration classification; and

(B) identify controlled substances using laboratory procedures such as color test reactions, microcrystalline procedures, chromatography, and spectrophotometry.

College and Career Readiness Standards

Science Standards

III. Foundation Skills: Scientific Applications of Communication

C. Presentation of scientific/technical information

1. Prepare and present scientific/technical information in appropriate formats for various audiences.

D. Research skills/information literacy

1. Use search engines, databases, and other digital electronic tools effectively to locate information.

Name_____ Date_____

Controlled Substances Exam

MATCHING

_____1.	High potential for abuse, currently acceptable medical use with severe restrictions, potential for severe dependence	A. Schedule I
_____2.	Very low abuse, medical use, lowest potential for dependence	B. Schedule II
_____3.	High potential for abuse and no currently accepted medical use	C. Schedule III
_____4.	Low potential for abuse, current medical use, limited dependence	D. Schedule IV
_____5.	Less potential for abuse, currently accepted medical use, low to moderate potential for physiological dependence and high psychological dependence	E. Schedule V

_____6.	Non-narcotic medicinal ingredients	A. Schedule I
_____7.	Anabolic Steroids	B. Schedule II
_____8.	Cocaine	C. Schedule III
_____9.	Diazepam	D. Schedule IV
_____10.	Heroin	E. Schedule V

MULTIPLE CHOICE

_____11. Which of the following is best described as an illegal substance?
- A. All drugs
- B. Controlled substances
- C. Prescription medications
- D. Illicit drugs

_____12. This type of drug can cause alterations in normal thought processes, perceptions, and moods:
- A. Narcotics
- B. Hallucinogens
- C. Depressants
- D. Stimulants

_____13. The Federal law that establishes the five classifications of drugs is called
A. Controlled Drug Law
B. Controlled Substance Act
C. Federal Drug Act
D. Criminal Penalty Act

_____14. Which of the following would be the most accurate way to identify all chemicals associated with an unknown substance?
A. Color test
B. Thin layer chromatography
C. Gas chromatography
D. Gas chromatography and mass spectrometry

_____15. How should a volatile substance, such as model cement, be packaged for evidence?
A. In a paper bag
B. In an airtight container
C. In a druggist fold
D. In a cardboard box

_____16. This type of drug speeds up the central nervous system:
A. Narcotic
B. Inhalant
C. Hallucinogen
D. Stimulant

_____17. Which of the following color tests turn blue in the presence of cocaine?
A. Marquis
B. Van Urk
C. Scott
D. Dillie-Koppanyi

_____18. Alcohol is an example of this type of drug:
A. Depressant
B. Hallucinogen
C. Stimulant
D. Club drug

_____19. The drug that is administered to heroin addicts to eliminate the addict's desire with minimal side effects is called
A. Oxycodone
B. Opium
C. Methadone
D. Ecstasy

_____20. "Downers," also known as barbiturates, belong to this category of drug:
A. Depressants
B. Hallucinogens
C. Narcotics
D. Stimulants

_____21. This type of dependence is caused by regular use and characterized by withdrawal sickness when administration of the drug suddenly stops:
A. Physical
B. Psychological

_____22. Which of the following is often associated with drug-facilitated sexual assaults, rape, and robbery?
A. Marijuana
B. Ketamine
C. LSD
D. Flunitrazepam

_____23. The side effects of these drugs are liver malfunction, cancer, masculinizing effects, personality changes, and depression:
A. Anabolic steroids
B. PCP
C. Alcohol
D. Diazepam

_____24. This color test yields an orange/brown color in the presence of methamphetamines:
A. Scott
B. Marquis
C. Dillie-Koppanyi
D. Duquenois-Levine

_____25. Which of the following uses a solid stationary phase and a moving liquid phase?
A. Thin layer chromatography
B. Bas chromatography
C. Infrared spectrophotometry
D. Mass spectrometry

Controlled Substance Exam Key

1. B
2. E
3. A
4. D
5. C
6. E
7. C
8. B
9. D
10. A
11. D
12. B
13. B
14. D
15. B
16. D
17. C
18. A
19. C
20. A
21. A
22. D
23. A
24. B
25. A

Name_____ Date_____

Analysis of White Powders

Rationale

This is a hands-on activity to simulate testing drugs in a toxicology lab. Various common white powders are used to represent drugs. In this lab, students will compare the physical and chemical properties of various white powders and also attempt to identify an unknown sample from known samples.

Materials (Per Group)

- 1 container each of the following:
  - Popcorn salt
  - Powdered sugar
  - Starch
  - Baking soda
  - Plaster
  - Unknown substance
- Vinegar
- Iodine
- Distilled water
- 3 petri dishes (1 bottom or top for each powder substance)
- Gloves
- Goggles
- 6 plastic spoons (1 for each of the powder substances)
- Grease pencil for marking petri dishes
- 18 Toothpicks
- Magnifying glass

Procedure:

1. Put on goggles and gloves *(Note: use caution with iodine as it may stain clothing; a lab apron may be used).*

2. Use a grease pencil to label one of the petri dishes (top or bottom) “Salt.” Repeat this step with each of the powder substances until all 6 dishes are labeled.

3. Using a plastic spoon, scoop about ½ tsp. of the salt into the petri dish marked “Salt” (this measurement is an approximation; about the size of a dime). Repeat this process with the other powder substances until all of the dishes are filled. Always keep the spoons with the appropriate powders. Do not cross contaminate.

4. Using the magnifying glass, observe each powder and record the visible characteristics: color, appearance (shiny, dull, small crystals, fine powder, etc.). Record your results on Data Table 1.

5. Add 3 – 5 drops of water to each of the powders, and stir with a toothpick. Discard the toothpick after stirring and be careful not to cross contaminate.

6. Observe and record any changes such as color, bubbling, heat (also feel the bottom of the dish).

7. Thoroughly clean the dishes, and repeat step 3 with each of the remaining liquids being careful not to cross contaminate. Record your results in the data table after each test.

8. After testing each of the powders with each of the liquids, compare the unknown sample to the known substances.

9. Answer the questions at the end of this handout.

DATA TABLE 1*

Substance	Color	Crystal Shape	Water	Vinegar	Iodine
Popcorn Salt					
Powdered Sugar					
Starch					
Baking Powder					
Plaster					
Unknown					

***** Record NR for "No Reaction" if the substance does not react to the liquid in any way

Questions

1. Understanding the difference between physical and chemical characteristics, list the ones you observed below:

   Physical _____

   _____

   _____

   _____

   Chemical _____

   _____

   _____

   _____

2. In your opinion, which type of characteristic is easier to analyze: physical or chemical? Why?

3. Were you able to tell what substance(s) the unknown is? If yes, which was it, and how did you come to this conclusion? If not, why not?

4. Explain how this lab is related to real-life situations testing unknown drugs, poisons, or other substances.

Analysis of White Powders Teacher's Notes and Key

- If supplies or time are limited for this lab, you can divide class into 6 groups and have each group test a specific substance; then they can share their data with the rest of the class
- Emphasize the hazard of cross-contamination and how results can be incorrect if this happens
- For the unknown sample, mix any two of the substances in any proportion
- To save time, reaction plates can be used in the place of petri dishes if they are available in your lab
- You can add a UV light as another physical characteristic
- A variation of this lab would be to substitute over-the-counter medications for the powders
- Basic powder reactions are as follows, but could be variable based on student opinion:

DATA TABLE 1

Substance	Color	Appearance	Water	Vinegar	Iodine
Popcorn Salt	Dull white	Small chunky grains	NR, dissolves slightly	NR	Yellow/brown
Powdered Sugar	Bright white	Fine powder	NR, dissolves slightly	NR	Yellow/brown
Starch	Bright white	Fine powder	NR, thickens	NR	Purple/black
Baking Powder	Bright white	Chunky powder	NR	Bubbles	Yellow/brown
Plaster	Dull, grayish white	Chunky powder	Thickens, releases heat	NR	Yellow/brown
Unknown	**ANSWERS WILL VARY**				

Answers to the Questions

1. Physical characteristics of this lab would include color, appearance, thickening or dissolving in water, or heat release. Chemical characteristics would include reactions to vinegar and iodine.
2. Answers will vary based on student opinion.
3. Answers depend on what substances made up the unknown.
4. This lab relates to actual unknown substance testing because if a substance is found, the first thing that is done is visual inspection to narrow down the possibilities. Chemical tests can finalize and identify the substances. Also, since the unknown in this lab was a mixture of two substances, it is what toxicologists experience regularly. Drug manufacturers will mix specific drugs with common items (such as baking powder) as "fillers" so they can produce greater quantities.

Name_____ Date_____

Discussion Rubric

Objectives	4 pts. Excellent	3 pts. Good	2 pts. Needs Some Improvement	1 pt. Needs Much Improvement	N/A	Pts.
Participates in group discussion						
Encourages others to join the conversation						
Keeps the discussion progressing to achieve goals						
Shares thoughts actively while offering helpful recommendations to others						
Gives credit to others for their ideas						
Respects the opinions of others						
Involves others by asking questions or requesting input						
Expresses thoughts and ideas clearly and effectively						
Total Points (32 pts.)						

Comments:

Name_____ Date_____

Individual Work Rubric

Objectives	4 pts. Excellent	3 pts. Good	2 pts. Needs Some Improvement	1 pt. Needs Much Improvement	N/A	Pts.
Follows directions Student completed the work as directed, following the directions given, in order and to the level of quality indicated						
Time management Student used time wisely and remained on task 100% of the time						
Organization Student kept notes and materials in a neat, legible, and organized manner. Information was readily retrieved						
Evidence of learning Student documented information in his or her own words and can accurately answer questions related to the information retrieved						
***Research/Gathering information (if relevant)** Student used a variety of methods and sources to gather information. Student took notes while gathering information						
Total Points (20 pts.)						

Comments:

Name:_____ Date:_____

Presentation Rubric

Objectives	4 pts. Excellent	3 pts. Good	2 pts. Needs Some Improvement	1 pt. Needs Much Improvement	N/A	Pts.
Topic/Content • Topic discussed completely and in-depth • Includes properly cited sources (if used)						
Creativity/Neatness • Integrates a variety of multimedia effects to create a professional presentation (transition and graphics) or appropriate visual aid used • Title slide, table of contents, bibliography are included, using acceptable format						
Mechanics • Grammar, spelling, punctuation, and capitalization are correct • Image and font size are legible to the entire audience						
Oral Presentation • Communicates with enthusiasm and eye contact • Voice delivery and projection are dynamic and audible						
Audience Interaction • Presentation holds audience's attention and relates a clear message • Clearly and effectively communicates the content throughout the presentation						
Total Points (20 pts.)						

Comments: