Worksheet 5-5—Lesson Plan Format (adapted with permission)	**Subject**: Chemistry A **Lesson Name**: Head to Head **Class**: Chemistry Date: 3/10/09	Teacher: Phillips/Maniere Location: WRHS **Unit Context**: History of Scientists
Activities	Big6™ Skills	Idaho Science Standards
<u>Instruction handout</u>: Your task is to: 1. Working in teams of two: each person will research one assigned scientist and his/her influence over their specific field of study. 2. Discover who the scientist is and why they are important? Discover unique or personal facts about the scientist's lives. (You will assume that persona in a presentation.) 3. Use the given list of sources (LiLI databases, science teachers, textbooks, professors, etc) to find the information. 4. Choose the 3 best sources (prioritizing the sources; most to least relevant). 5. Locate sources. List where to find (geographically, city, country, university/institution, phone numbers, email addresses, etc) 6. Go and get it (call, use databases, internet, books, etc.). Are these usable sources? 7. Need to get teacher approval! 8. Digest material: Read, study instruments (tools of the times), charts, and recall information. Students are building a case for their character (character's notoriety in the field of science)	1.1 Knowledge of scientist and influence over their specific field of study. 1.2 Assume the role of scientist. Who are you and why are you important? Discover unique or personal facts about the scientist's lives. 2.1 Students given list of sources (LiLI databases, science teachers, textbooks, professors, etc). 2.2 Choose 3 best sources (prioritizing the sources; most to least relevant). 3.1 Locate sources. List where to find (geographically, town, country, university/institution, etc) 3.2 Go and get it (call, used databases, internet, books, etc.). Are these usable sources? Need to get teacher approval! 4.1 Digest material: Read, study instruments (tools of the times), charts, and recall information. Students are building a case for their character (character's notoriety in the field of science and possibly in the public eye) 4.2 Recover and extrapolate information to meet project goals. 5.1 Create the persona of the scientist (who are you and why are you here). Prepare visual display of instruments used to make discovery (and scientific	**Goal 5.2: Understand the Relationship between Science and Technology** **Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors** **Goal 1.1: Understand Systems, Order, and Organization** **Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills** **Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations** **Goal 1.8: Understand Technical Communication**

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9. Recover and extrapolate information to meet project goals. 10. Create the persona of the scientist (who are you and why are you here). Prepare visual display of instruments used to make discovery (and scientific tools of the times). 11. Prepare a presentation of scientist's achievements and plan to refute counter-information presented by co-presenter. 12. Panelists will determine credibility of scientists. Rubric - (teacher and peer review of presentation), Panelists need to answer question "which scientist will stand the test of time?" 13. Presenter is given evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?	tools of the times). 5.2 Students are preparing a presentation of scientist's achievements and preparing to refute counter-information presented by co-presenter. 6.1 Panelists will determine credibility of scientists. Rubric - (teacher and peer review of presentation). Panelists need to answer question "which scientist will stand the test of time?" 6.2 Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?	

Learning Context:

1. This is in the context of the first week of chemistry as an introduction to the history and character base in the field of chemistry. We feel this would be a great kick-off to developing 21st century skills as well as to chemistry.

Materials/Resources:

1. Use the given list of sources (databases [LiLI], science teachers, textbooks, professors, etc) to find the information.

Evaluation:

1. Panelists will determine credibility of scientists. Rubric (teacher and peer review of presentation), Panelist need to answer question "which scientist will stand the test of time?"
2. Presenter is given evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?

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Worksheet 5-5—Lesson Plan Format (adapted with permission)	**Subject**: Physical Science **Lesson Name**: Light Vs Pigment **Class**: PS – Light Unit Date: 3/10/09	Teacher: Phillips/Maniere Location: WRHS **Unit Context**: Light and Energy
Activities	Big6™ Skills	Idaho Science Standards
<u>Instruction handout</u>: Your task is to: 1. In teams of two, with one person assuming responsibility for pigment and one for light: a. Identify 3 primary colors of light, 3 secondary colors, and the resulting color of blending 3 primary colors of light. b. Identify 3 primary colors of pigment, 3 secondary colors of pigment, and the resulting color of blending 3 primary colors of pigment. 2. Generate a list of colors of light and pigment that can be arranged. Review rubric, make sure you are following task at hand! Don't forget to ask questions. Brainstorm sources and location (web, database, textbook, professionals, business/industry, periodicals, etc.) creating a list of at least six different resources. 3. Choose four best sources (prioritizing the sources; most to least relevant). 4. Locate sources. List where to find (geographically, addresses, phone numbers, etc) 5. Go and get it (call, used databases, internet, books, etc.). Are these usable sources? Need to get teacher approval! 6. Read, study charts and diagrams, and recall information. 7. Recover and extrapolate information to meet project goals. 8. Make two color wheels (one for light and one for pigment) and chart (mind map/web) showing the relationship of how visible light fits	1.1 Identify 3 primary colors of light, 3 secondary colors, and the resulting color of blending 3 primary colors of light. Identify 3 primary colors of pigment, 3 secondary colors of pigment, and the resulting color of blending 3 primary colors of pigment. 1.2 Student generated list of colors of light and pigment that can be arranged. Review rubric, make sure you are following task at hand! Don't forget to ask questions. 2.1 Brainstorm sources and location (web, database, textbook, professionals, business/industry, periodicals, etc.) creating a list of at least six different resources. 2.2 Choose four best sources (prioritizing the sources; most to least relevant). 3.1 Locate sources. List where to find (geographically, addresses, phone numbers, etc) 3.2 Go and get it (call, used databases, internet, books, etc.). Are these usable sources? Need to get teacher approval! 4.1 Read, study charts and diagrams, and recall information. 4.2 Recovered and extrapolate information to meet project goals. 5.1 Make two color wheels (one for light and one for pigment) and chart (mind map/web) showing the relationship of how visible light fits into the *Electromagnetic wave Spectrum*. This will clearly show a relationship between the wavelength and the type of *Electromagnetic wave (radio wave vs Infrared vs visible light vs gamma)*. Students	**Goal 1.1: Understand Systems, Order, and Organization** **Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations** **Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills** **Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors** **Goal 1.8: Understand Technical Communication** **Goal 5.2: Understand the Relationship between Science and Technology**

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into the *Electromagnetic wave Spectrum*. This will clearly show a relationship between the wavelength and the type of *Electromagnetic wave (radio wave vs Infrared vs visible light vs gamma)*. 9. Create a diagram/picture which clearly shows how some colors of light are absorbed by certain pigments while other colors of light are reflected resulting in the perception of a 'color' we see in an object. *10.* Competently present the color wheels and *Electromagnetic Spectrum in a two minute presentation*. Teams will share presentation responsibility, one presenting light (this person prepared pigment work), one taking pigment (this person prepared light work). Each team presents to a team of their peers. 11. Rubric (teacher and peer review of presentation), Students need to answer question "what did you learn about the difference between color of light and color of pigment?" 12. Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?	will also create a diagram/picture which clearly shows how some colors of light are absorbed by certain pigments while other colors of light are reflected resulting in the perception of a 'color' we see in an object. 5.2 Competently present the color wheels and *Electromagnetic Spectrum in a two minute presentation.* 6.1 Rubric (teacher and peer review of presentation), Students need to answer question "what did you learn about the difference between color of light and color of pigment?" 6.2 Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?	

Learning Context:

This lesson begins our discussion of energy and is an important link in integrating the concept of energy into the fabric of Physical Science, bringing the students into the research process using 21st century skills and techniques.

Materials/Resources:

1. Use the given list of sources (databases [LiLI], science teachers, textbooks, professors, etc) to find the information.
2. Resources will include: professionals in business/industry.

Evaluation:

1. Rubric (teacher and peer review of presentation), Students need to answer question "what did you learn about the difference between color of light and color of pigment?"
2. Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?

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Worksheet 5-5—Lesson Plan Format (adapted with permission)	**Subject**: Chemistry A **Lesson Name**: Minerals and My Life **Class**: Chemistry Date: 3/10/09	Teacher: Phillips/Maniere Location: WRHS **Unit Context**: Periodic Table, Minerals, and Idaho
Activities	Big6™ Skills	Idaho Science Standards
<u>Instruction handout</u>: Your task is to: 1. Identify 3 minerals that exist in Idaho. 2. Identify where they are used in 3 different industries (places) 3. Identify how they are processed (from earth to end product) and how they are used. (Agriculture, food, technology, building/construction, fashion, jewelry, cosmetics, etc.) As a class students will generate a list of industries that use minerals in Idaho. 4. Review rubric, make sure you are following task at hand! Ask any necessary questions! 5. Brainstorm several sources, creating a list of at least six different resources (web, database [LiLI], textbook, professionals, business/industry, periodicals, etc.) 6. Choose four best sources (prioritizing the sources; most to least relevant). 7. Locate sources. List where to find (geographically, addresses, phone numbers, etc) 8. Go and get it (call, used databases, internet, books, etc.). Are these usable sources? Solicit teacher approval. 9. Read, study maps, charts, and recall information. 10. Recover and extrapolate information to meet project	1.1 Identify 3 minerals that exist in Idaho. Identify where they are used in 3 different industries (places) and how they are processed (from earth to end product). 1.2 Student generated list of industries. Possible list of 10-15 minerals to aid students. (Agriculture, food, technology, building/construction, fashion, jewelry, cosmetics, etc.) Review rubric, make sure you are following task at hand! Don't forget to ask questions. 2.1 Brainstorm sources and location (web, database [LiLI], textbook, professionals, business/industry, periodicals, etc.) creating a list of at least six different resources. 2.2 Choose four best sources (prioritizing the sources; most to least relevant). 3.1 Locate sources. List where to find (geographically, addresses, phone numbers, etc) 3.2 Go and get it (call, use databases, internet, books, etc.). Are these usable sources? Need to get teacher approval! 4.1 Read, study maps, charts, and recall information. 4.2 Recover and extrapolate	**Goal 1.1: Understand Systems, Order, and Organization** **Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations** **Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills** **Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors** **Goal 1.8: Understand Technical Communication** **Goal 5.2: Understand the Relationship between Science and Technology**

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goals. Annotated bibliography – 4 11. Correctly cited, using appropriate format (Science CBC, English MLA, Social Science APA). Summarize main idea from each source. 12. Review rubric, make sure you are following task at hand! 13. Make a graphic and text flow chart (mind map/web) of the process (earth to end product) which clearly shows a relationship between the mineral and the student. (see examples [both good and bad] from teacher) 14. Competently present one of the 3 minerals for 2 minutes without reading and answer questions afterward. 15. Rubric (teacher and peer review of presentation), Students-audience members complete a rubric on every presenter and answer question "what did you learn about the mineral just presented?" 16. Complete presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block, what would you do over? 17. You will be provided with: project expectations and grading rubric.	information to meet project goals. Annotated bibliography – 4 Correctly cited, using appropriate format (Science CBC, English MLA, Social Science APA). Summarize main idea from each source. 5.1 Make a graphic and text flow chart (mind map/web) of the process (earth to end product) which clearly shows a relationship between the mineral and the student. 5.2 Competently present one of the 3 minerals for 2 minutes without reading and answer questions afterward. 6.1 Rubric (teacher and peer review of presentation), Students need to answer question "what did you learn about the mineral?" 6.2 Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block, what would you do over?	

Learning Context:

This lesson begins the periodic table/periodicity unit with a broader view of minerals student can find in Idaho, bringing the students into the research process using 21st century skills and techniques.

Materials/Resources:

1. Use the given list of sources (databases [LiLI], science teachers, textbooks, professors, etc) to find the information.
2. Resources will also include: professionals in business/industry.

Evaluation:

1. Rubric (teacher and peer review of presentation), Student-audience members complete a rubric on every presenter and answer question "what did you learn about the mineral just presented?"
2. Presenter completes evaluation form: What was difficult, what took too long, what was the biggest stumbling block,what would you do over?
3. You will be provided with: project expectations and grading rubric.

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Worksheet 5-5—Lesson Plan Format (adapted with permission)	**Subject**: Physical Science **Lesson Name**: That's My Job! **Class**: PS – Date: 3/10/09	Teacher: Phillips/Maniere Location: WRHS **Unit Context**: Intro to PS
Activities Stage setting: Students attend presentation of three professionals in science field relating to lessons 1, 2, 3 (a research scientist [scientists in history], a radiologist [use of energy], a person who utilizes Idaho's natural resources and energy [miner, mineralogist]). Students are provided a list of possible careers. **<u>Instruction handout</u>**: Your task is to: 1. Identify 3 possible careers in the field of STEM (science, technology, engineering, or mathematics) and fill out career worksheets (3). (Information is provided; includes the professional presentations and specific databases, websites, Naviance software, and other occupational handbooks, etc.) 2. Students will complete Naviance personal assessment. 3. Students brainstorm and create parent interview sheet. 4. Students perform a parent/adult interview focused on parent's career aspirations in HS or college. 5. Select one career that matches your assessment. Confirm with teacher. 6. Using above resources, expand knowledge of the field using said criteria in anticipation of written report. 7. Digest material: utilizing a personal exploration worksheet, reading, study materials. 8. Formulate a ten year '*action plan*' to pursue that career beyond HS	Big6™ Skills 1.1 Identify 3 possible careers in the field of STEM (science, technology, engineering, or mathematics). 1.2 Information is provided; includes the professional presentations and specific databases (LiLI), websites, Naviance software, and other occupational handbooks, etc. 2.1 Students given list of sources (LiLI databases, science teachers, textbooks, professors, etc). 2.2 Students complete three separate career worksheets and select the one that they are most interested in. Students perform a parent/adult interview focused on parent's career aspirations in HS or college (students brainstorm and provide interview sheet). 3.1 Locate sources. List where to find (geographically, town, country, university/institution, etc) 3.2 Go and get it (call, use databases, internet, books, etc.). Are these usable sources? Need to get teacher approval! 4.1 Digest material: utilizing a personal exploration worksheet, reading, study materials. Formulate a ten year '*action plan*' to pursue that career beyond HS (i.e., 4-year plan, HS courses, summer jobs, internships, college visits, field trips, etc.).	Idaho Science Standards **Goal 1.1: Understand Systems, Order, and Organization** **Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations** **Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills** **Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors** **Goal 1.8: Understand Technical Communication** **Goal 5.2: Understand the Relationship between Science and Technology**

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(i.e., 4-year plan, HS courses, summer jobs, internships, college visits, field trips, etc.). 9. Prepare the fact sheet and personal sheet. 10. Create visual display (full sized poster of a ***Scientific American*** magazine cover with you in science career). Poster to be displayed in public area of school and/or on webpage. 11. Create a podcast on a school website to share specific career information (guided by fact sheet). 12. Students may present this material at local career fair? 13. Students turn in written report (according to teacher requirements) comparing personal skill set to the needed skill set of that specific scientist and why student chose this career path. 14. Classmates judge student podcast per given Rubric (teacher and peer review of podcast presentation). Teacher evaluates written report with rubric. 15. Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?	4.2 Recover and extrapolate information to meet project goals. 5.1 Prepare the fact sheet and personal sheet. 5.2 Create visual display (full sized poster of a *Scientific American* magazine cover with you in science career), create a podcast on a school website to share specific career information (guided by fact sheet). Students may present this material at local career fair? Students turn in written report comparing personal skill set to the needed skill set of that specific scientist and why student chose this career path. 6.1 Classmates judge student podcast per given Rubric (teacher and peer review of podcast presentation). Teacher evaluates written report with rubric. 6.2 Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block and what would you do over?	

Learning Context:

This lesson begins our year in Physical Science with the relevance of what happens in the classroom to what is actually necessary to make science work in the real world (INL). It is our hope that this will be a stepping stone for students to begin focusing on the necessary steps students must take in order to create a career for them in science, utilizing 21st century skills and techniques.

Materials/Resources:

1. Use the given list of sources (databases [LiLI], science teachers, text books, professors, etc) to find the information.
2. Resources will include: professionals in business/industry.

Evaluation:

1. Students turn in written report (according to teacher requirements) comparing person skill set to the needed skill set of that specific scientist and why student chose this career path.
2. Classmates judge student podcast per given Rubric (teacher and peer review of podcast presentation). Teacher evaluates written report with rubric.
3. Give presenter evaluation form: What was difficult, what took too long, what was the biggest stumbling block, what would you do over?

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Matthew Phillips/Geraldine Maniere
3/10/09
Citations to websites our students are expected to navigate and utilize for information.

Lesson - Minerals and Me

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Lesson – Head to Head

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