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| **Name:** Jaclyn Jones | **Contact Info:** jonesja@lovelandschools.org | **Date:** March 2014 |

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| **Lesson Title :** Lesson 2: Survival Backpack Project | **Unit #:**  1 | **Lesson #:**  2 | **Activity #:**  4 |
| **Activity Title:** Activity 4: Designing a Survival Backpack |

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| **Estimated Lesson Duration:** | 3, 90 minute class blocks |
| **Estimated Activity Duration:** | 3, 90 minute class blocks |

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| **Setting:** | Classroom or place where you can have laptops for research |

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| **Activity Objectives:** The SWBAT design a survival backpack which will allow them to survive for a 2 week stay in a unknown location.  Students will be:   1. Researching the place they will be going to by identifying  * the specific biome * the temperature (highs and lows) * location in the world * how much precipitation occurs * sources of clean water * soil type * common vegetation and common adaptations * native animals and common adaptations * food chain * poisonous creatures or plants  1. Identifying a series of survival strategies (refer to questions Sheet on Survival Project) pertaining to the specific location they will be traveling to. 2. Designing a survival backpack with 6 items in it to help them survive in this location. 3. Justifying the purpose of each of the items chosen |

**Activity Guiding Questions:**

1. Would you be able to survive?
2. What is survival?
3. Where am I going?
4. How long am I staying?
5. Conditions?
6. What are the guidelines for my backpack?

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| **NGSS Practices of Science and Engineering / Crosscutting Concepts** |

| **Practices of Science and Engineers (Check all that apply)** | **Crosscutting Concepts (Check all that apply)** |
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| ☐ Asking questions (for science) and defining problems (for engineering) | ☐Patterns |
| ☐ Developing and using models | ☐ Cause and effect |
| ☐ Planning and carrying out investigations | ☐ Scale, proportion, and quantity |
| ☒ Analyzing and interpreting data | ☐ Systems and system models |
| ☐ Using mathematics and computational thinking | ☒ Energy and matter: Flows, cycles, and conservation. |
| ☐ Constructing explanations (for science) and designing solutions (for engineering) | ☒ Structure and function. |
| ☐ Engaging in argument from evidence | ☒ Stability and change. |
| ☒ Obtaining, evaluating, and communicating information |  |

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| **Unit Academic Standards (Ohio State Revised Science Education Standards and/or NGSS Content, Common Core etc.):**  -BIO.912.7b- Match two organisms in the same classification  -BIO.912.7c-Sort plants and animals according to their classification  -BIO.912.8a- Describe how plant/animal population changes in relation to the availability of certain resources  -BIO.912.8b- Identify how a population would change in relation to predator/prey relationships  -BIO.912.8c-Match a plant/animal to a resource it uses from its environment |

**Cognitive Demands (Ohio State Revised Science Education Standards)**

| **Expectations for Learning Cognitive Demands (Check all that apply)** |
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| ☐ Designing Technological/Engineering Solutions Using Science concepts **(T)** |
| ☒ Demonstrating Science Knowledge **(D)** |
| ☒ Interpreting and Communicating Science Concepts **(C)** |
| ☒ Recalling Accurate Science **(R)** |

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| **Materials**: See attachments:   1. Project guidelines which include a question handout and a rubric. |

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| **Teacher Advance Preparation:** Teachers will need to have copied the questions and have a copy for each group. |

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| **Activity Procedures:**   1. Students are given the handout and the teacher goes over the directions and guidelines to the project (see attachment). 2. Students are able to work on the research to find out all of the requirements for the project. 3. Students will work in groups to come up with a proper “survival backpack” 4. Students will turn in a rough draft. 5. Teacher will give the “twist” to the project. Please see attachment. |

**Formative Assessments:** The questions and backpack will be the formal assessment.

**Summative Assessments:** Rubric for Survival Project (See attachment).

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| **Differentiation:** I pair my students in this activity, so I make sure a lower level student is working with a higher level student so the higher level student can teach the lower level student and so that the lower level student does not get lost in the process. To challenge my higher level student I will go around and ask them to extend on their knowledge. |

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| **Reflection:** Students really like this project because it is a combination of everything they have learned and it is a new project where they have the freedom to problem solve to come up with ideas to survive. It is taking Biology out of just the class and having them use real world problems to solve their issue. My students are really excited to do this. |