The following lesson demonstrates the importance of considering differentiation when planning for instruction. The following elements of universal design have been considered:

**Differentiation of content:** Multiple, flexible presentation of content
- The class constructed a food chain with the local species the students chose; this relates interests and real-world situations
- Assignment portion of the lesson plan involves a lot of choice, therefore choice as been built into the learning goals
- The lecture portion of the lesson will change depending on how well the class does during the pre-assessment portion at the start of class when I check for prior knowledge
- If some students could not take traditional notes I provided them with a copy or they were allowed to use any form of assistive technology

**Differentiation of process:** Multiple, flexible ways in which students are engaged
- I varied my teaching strategy from discussion to lecture followed by group/individual work
- Students were provided with both audio and visual representations of food chains/webs and all the associated vocabulary
- They were encouraged to work in groups or individually in order to practice the content
- Many choices were given to students in regard to which way they wanted to practice the content

**Differentiation of product:** Multiple, flexible ways in which students may demonstrate learning
- Before they began their assignments all students had checked in with me. This ensures I know what they’re working on and encourages them to make a decision and get started
- By incorporating multiple intelligences into the assignment created for them I was able to foster their learning styles and interests within their work
- Struggling and enriched students were both given many different options to demonstrate their knowledge
- Many of the assignments provide real-world interests

**Accomodations and Modifications**
On an individual basis, the plan could be accommodated or modified to include students with varying abilities as follows:

Further instruction for students of lower ability:
- *See attached lesson plan*

Further activities for enrichment
- *See attached lesson plan*
**Course:** Biology 20 (Alberta Curriculum)  
**Name:** Mr. C. Adamson  
**Date:** 2012-25-06  
**Topic:** Food Chains and Webs  
**Unit:** Energy and Matter Exchange  
**Grade:** 11  
**Materials:** Powerpoint presentation, student handouts, samples of successful work

### Outcomes/Purpose:

#### Outcomes:
- Explain the structure of ecosystem trophic levels, using models such as food chains and food webs. (20–A1.3k)
- Draw, by hand or using technology, annotated diagrams of food chains, food webs and ecological pyramid. (20–A1.2s)

#### Academic Purpose:
- Students will demonstrate an understanding of ecosystem trophic levels by using models such as food chains and webs
- Students will work individually or small groups to investigate the relationships between the species in different trophic levels

### Instructional Plan:

#### Introduction: (~10 minutes)
- **Hook:** Have the following question on the board when students enter; “Are we at the top of the food chain?”
- Allow a discussion to occur but move onto the following questions naturally
- **Ask** students several of the following questions to introduce the topic and discovered prior knowledge
  - Where does all the energy on Earth originally come from?
  - What organisms are capable of capturing that energy and transforming it?
  - What are producer, consumers, and decomposers?
  - What does it mean when we say “top of the food chain”?
- **Ask** students to name several local flora and fauna and write what they say on the board
  - Once approximately 10-15 species are on the board ask students to list them from lowest on the food chain to highest
  - This chain/web will be referred to later in the class

#### Body: (50 minutes)

**Powerpoint presentation** (10-15 minutes)
- **Explain** to students that what they have just done is create very good representation of a food chain
- **Explain** to students the following terms, making sure they take their own set of notes
- As each of these terms is explained, refer back to the food chain the class constructed together
  - Energy
  - Primary producer
  - Primary, secondary and tertiary consumer
  - Trophic level
  - Food chain
  - Food web

**Work time** (35-40 minutes)
- **Draw attention** to the student assignment handout (Ecology – Food Chains and Webs)
- Explain the assignment and each different way of demonstrating their knowledge of food chains/web
- Once complete show students several examples of what successful work looks like
- Remind students of the directions at the top of their handout and that they must decide on an assignment by the end of class

#### Closure: (5 minutes)
- **Remind** students of the due date for the assignment and to state which assignment they have chosen before they leave today
### Assessment:
- As they work in the final 40 minutes of class I will also obtain a formative assessment of the students by listening to the language they use and asking them questions.
- I will summatively assess the students when they hand in their assignments at a later date.

### Supporting Students:

#### Struggling Students:
- If I notice certain students are not following during the lesson I will approach them at the end of the class during the work time to ensure everything I covered is OK with the student.
- If students are having trouble during the work time I will be circulating to help them with any problems that arise.
- Students who are not efficient note takers will be provided with printed versions of the notes or allowed to use any supporting technology to help them record notes.
- Students who can’t work at the level needed to complete certain assignments on the student handout can come up with their own way to demonstrate their knowledge of the subject matter with my approval.
  - However, many of the assignments are differentiated (choice of food chain or web) so students at any ability level can successfully complete them.

#### Enrichment:
- For students who feel the need to go above and beyond what I have supplied on the student handout I will consider alternative assignments they approach me with.
- If certain students desire to they can present their work to the class in order to reinforce the class’ learning.
- If high achieving students quickly complete the assignment using a food chain instead of a web I can encourage them to include a food web as well.
- For students who have successfully completed the assignment with a food web and are looking for more of a challenge, I can have them analyze the relationship between heavy metals/toxins released into the environment in their food web and analyze the impact of this relationship on the quality of life.

Reflections:
Choose any of the boxes below and follow the directions within to demonstrate your understanding of food chains/webs.

You have the rest of class today to find a partner (if you choose) and decide on an assignment

By the end of the class today you will have to tell me which assignment you have chosen

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<th>Naturalist</th>
<th>Musical</th>
<th>Logical/Mathematical</th>
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<td>In groups of two explore the natural environment and take pictures to demonstrate you understand the various trophic levels in a food chain or web. The pictures should include at least one producer, one consumer and one decomposer and should be labeled.</td>
<td>Individually or in pairs sing, rap or write lyrics to demonstrate your understanding of how energy travels through the different trophic levels in a food chain or web. There is no exact length to this task; however, be sure to include at least one producer, one consumer and one decomposer in your work.</td>
<td>Individually use a graph to represent the cyclical patterns involved in predator-prey relationships. You may use any two species (i.e. wolves and rabbits). Hint: Using a scatterplot with the x-axis as time, the y-axis as population and having both species on the plot will help get you started.</td>
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<th>Interpersonal</th>
<th>Bodily/Kinesthetic</th>
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<td>Individually or in pairs, using what you know about food chains and webs describe an imaginary food chain that would exist on a planet you’ve invented. Be sure to include the key aspects of food chains and webs (producers, consumers and decomposers).</td>
<td>In groups of 2 or 4 create a small lesson on food chains and webs to present to the class. This lesson should be no longer than five minutes and should include the important aspects of food chains and webs (producers, consumers and decomposers). Be creative and include some local examples.</td>
<td>In groups of 4 use the string provided to demonstrate how energy would flow through a food chain or web. Each student should represent a species involved in the food web and the string demonstrates transfer of energy.</td>
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<th>Visual/Spatial</th>
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<td>Individually or in groups of 2 prepare a short poem or play that you can recite for the class that demonstrates your understanding of food chains and webs. If you prefer to not perform in front of the class you or your group can perform in front of the teacher.</td>
<td>Using diagrams and/or flow charts demonstrate your knowledge of food chains and webs. The choice of diagram is up to you; however it must include the key aspects of food chains and webs (producers, consumers and decomposers).</td>
<td>Choose a species that you can relate to and write a journal (dear diary) about how it would feel to be in its trophic level within a food chain or web. The second part of your journal should include an idea about how you would change trophic levels.</td>
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