Lesson Title: Animal Identification Standards

Rationale
Why is this lesson important? Why does the student need this lesson? How does this lesson fit in the larger module?

Using tags for animal identification is common for livestock and pets. The advantages of using RFID include the ability to track and trace an animal for containment of diseases. The student needs this lesson to understand animal identification standards.

Objective(s)
What will the student know, be able to do, and value at the end of this lesson? This is smaller amounts of information than the module objectives.

The student will be able to recall the two common frequencies for animal identification tags, describe the reason the frequencies for animal identification were chosen, and describe why animal tags have the given range.

Exploration
Explicit concepts related to the Module goal are explored. It is at this point that the student will be provided basic information about the topic and the chance to explore some basic concepts about the topic. This is where the instructor imparts information.

- Animal Identification Standards
  - International standard 134.2 kHz
    - ISO 11784: "Radio-frequency identification of animals" – code structure
    - ISO 11785: "Radio-frequency identification of animals" – Technical concept
    - ISO 14223: "Radio-frequency identification of animals" – Advanced transponders
  - U.S. standard 125 kHz
  - At these frequencies the RF can penetrate mud, blood, and water

Reflection
Several questions are posed to the student to answer and then often discuss as a class. This is an attempt to determine whether the student "gets" the basic concepts delivered above. If they do get it, move on to engagement. If they do not get it, go back to exploration above. It could be as simple as asking a few probing questions or as complex as asking the student to write a paper.

- Why are LF frequency ranges used for animal identification tags?

Engagement
Concepts learned in the Exploration are further developed by conducting experiments, designing and building solutions, and solving problems. This is an attempt to cause the student to apply the new knowledge. By applying the new knowledge, the student is much more likely to retain this information. This engagement could be accomplished through a debate, an experiment, a problem solving activity, or anything else that would cause the student to demonstrate understanding and competence.
Homework assignment

Expansion
Provide opportunities for students to expand the concepts to more general or global situations including connection to the Module goal. Expand back to the big ideas of the module and prepare for the next lesson.

- Do you think the nominal read range for animal identification tags is long or short?

Lesson Assessment
Assess student understanding of the lesson content. This does not have to be a full-blown examination. It could be a graded homework assignment, a quiz, a performance examination, a graded problem solving activity, or something similar.

- Homework assignment

Equipment
- None

Software
- None

References
Copyright Notice
This material is Copyright © 2008, 2009 by Dale R. Thompson. It may be freely redistributed in its entirety provided that this copyright notice is not removed. It may not be sold for profit or incorporated in commercial documents without the written permission of the copyright holder.

Acknowledgment
These materials were developed through a grant from the National Science Foundation at the University of Arkansas. Any opinions, findings, and recommendations or conclusions expressed in these materials are those of the author(s) and do not necessarily reflect those of the National Science Foundation or the University of Arkansas.

Liability Release
The curriculum activities and lessons have been designed to be safe and engaging learning experiences and have been field-tested with university students. However, due to the numerous variables that exist, the author(s) does not assume any liability for the use of this product. These curriculum activities and lessons are provided as is without any express or implied warranty. The user is responsible and liable for following all stated and generally accepted safety guidelines and practices.