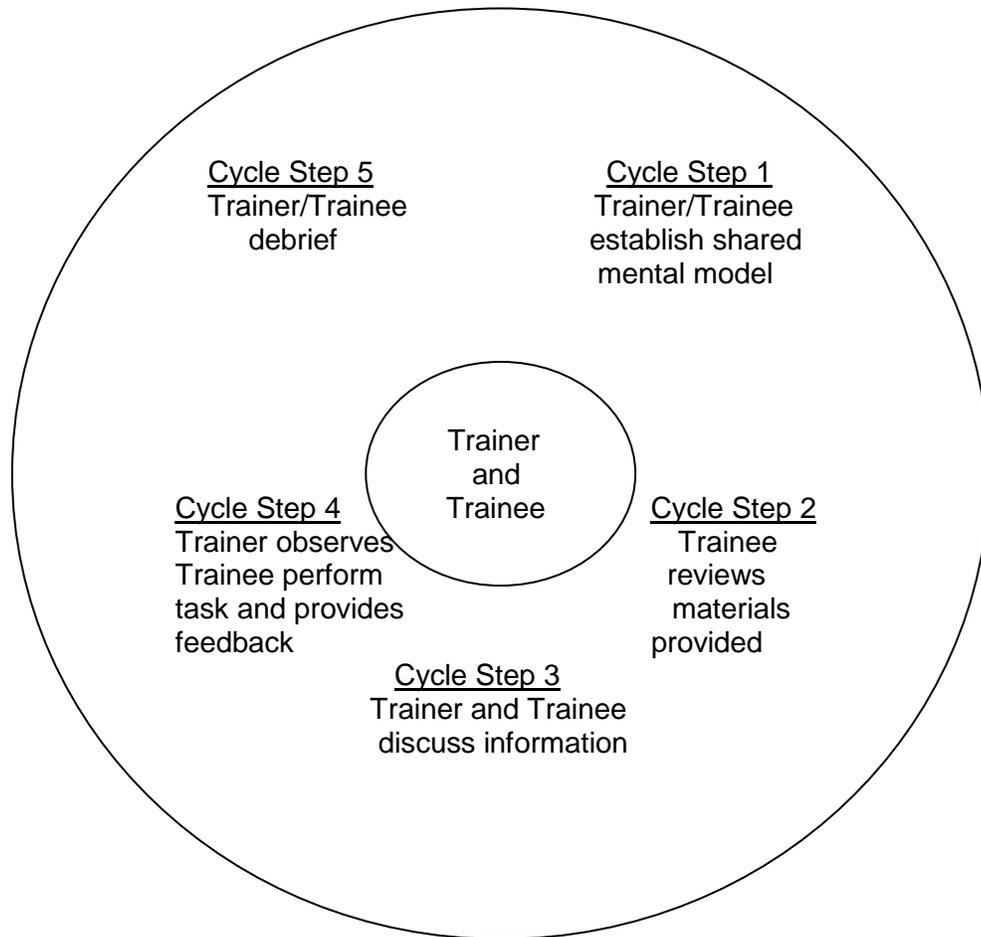


## OJT Training Module Cover Sheet

<b>Title:</b> 820 Understand GPR and how GPR works.
<b>Type:</b> <input type="checkbox"/> Skill <input checked="" type="checkbox"/> Knowledge
<b>Performance Objective:</b> Trainee will be able to: <ul style="list-style-type: none"><li>• Recognize the GPR and radar acronyms and their definitions.</li><li>• List the components of a GPR system and its restrictions.</li><li>• Describe how GPR works.</li><li>• Understand the uses and limitations of GPR in their survey area.</li></ul>
<b>Target Proficiency:</b> <input type="checkbox"/> Awareness <input checked="" type="checkbox"/> Understanding <input type="checkbox"/> Perform w/ Supervision <input type="checkbox"/> Apply Independently <input type="checkbox"/> Proficiency, can teach others
<b>Trainer Preparation:</b> <ul style="list-style-type: none"><li>• Trainer should be familiar with the assigned reading/review material in the lesson plan that follows.</li><li>• Must be knowledgeable about GPR systems and theory.</li></ul>
<b>Special Requirements:</b> Initiate an external learning request with a SF-182 in Aglearn for this activity. Instructions and a template are located on the training webpages for OJT modules.
<b>Prerequisite Modules:</b> None
<b>Notes:</b> None
<b>Authors:</b> Jim Doolittle Wes Tuttle
<b>Approved by:</b> Shawn McVey

# The Five-Step OJT Cycle for Declarative Training (Knowledge)



## OJT Module Lesson

Title: **820 Understand GPR and how GPR works.**

WHAT	WHY, WHEN, WHERE, HOW, SAFETY, QUALITY
Cycle step 1	Trainer and trainee review objectives of module.
Cycle step 2	Review the attached <b>What is ground-penetrating radar (GPR).pdf</b>
Cycle step 3	Trainer asks trainee to:
1. Describe what is GPR.	<ul style="list-style-type: none"> <li>• Discuss the acronyms GPR and radar.</li> </ul>
2. Describe how GPR works.	<ul style="list-style-type: none"> <li>• GPR as a time scaled system.</li> <li>• Resolution and depth in regards to high and low frequency investigations.</li> <li>• The soil properties in your survey area that provide good energy reflection to the antenna.</li> <li>• The soil properties in your survey area that mask reflection to the antenna.</li> <li>• How boundaries on the radar record represent differences in water and clay content, grain size distribution and/or porosity, as well as electrical properties of the layers themselves.</li> </ul>
3. Identify the major components of a GPR.	<ul style="list-style-type: none"> <li>• Review what data loggers and antennas are available in your survey area, where they are located, and who your contact is.</li> <li>• Describe the data logger(s) and GPR system(s) available to your survey area.</li> </ul>
4. Discuss antenna frequency.	<ul style="list-style-type: none"> <li>• Describe the signal range used by the GPR.               <ul style="list-style-type: none"> <li>○ Low frequency for water table, lithological, and stratigraphic studies in areas of more conductive and attenuating materials.</li> <li>○ High frequency for relatively dry, electrically resistive soils.</li> </ul> </li> </ul>
Cycle step 4	Have the trainee review the ideas above and then ask them to describe the GPR system and how it works.
Cycle step 5	Trainer can debrief trainee and address any concerns.

## OJT Module Lesson Measurement of Learning

Title: **820 Understand GPR and how GPR works.**

<b>WHAT</b>	<b>WHY, WHEN, WHERE, HOW, SAFETY, QUALITY</b>
Trainee's learning is measured.	Have the trainee complete the attached quiz to reinforce the concepts in this module.
Apply knowledge gained to work.	The trainee can describe a GPR system, how it works, recognize the major components and restrictions associated with the technology.

### **SF-182**

Trainee and/or supervisor access Aglearn to verify completion of the module via its SF-182.

## Quiz

1. Pulses of radiate energy are reflected from interfaces separating layers with different:
  - A) Horizon designations.
  - B) Thickness.
  - C) Color.
  - D) Dielectric permittivity.
2. A typical radar unit consists of:
  - A) Digital data logger and GPR receiver.
  - B) Thermal plotter and antenna.
  - C) Control unit and antenna.
  - D) GPS receiver and recorder.
3. True or False? The resolution of subsurface features will increase with increasing depth of exploration?
4. True or False? Low frequency antennas provide greater resolution and exploration depths than high frequency antennas?
5. What is the range in antenna center frequencies most commonly used in soil investigations?
  - A) 12.5 to 70 MHz
  - B) 100 to 500 MHz
  - C) 500 to 900 MHz
  - D) 1.5 to 2.5 GHz