Intended Audience

The Map Reading unit was created to develop the map reading skills of Soldiers ages 18 to 45. This unit was designed as a web based learning platform to enable anytime learning outside of a classroom. The images were created to provide visual support to the required military references “Field Manual 3-25.26: Land Navigation” and “Soldier Training Publication 21-1: Warrior Skills Level 1”. This training is the foundation for land navigation and is critical to the Warrior Tasks that all Soldiers are required to know.

Graphic Description

Lesson 1, Page 2 – Military Map image is a map projected from an image of the Earth. The Earth is divided into grid squares demonstrating how the Earth is divided into sections with a map for each section. Above the image is the definition of a map: “A map is a graphical representation of a portion of the earth’s surface drawn to scale, as seen from above. It uses colors, symbols, and labels to represent features found on the ground”. The graphic was designed to visually express that same definition. This graphic takes advantage of white space and the principals of CARP.

Lesson 1, Page 3 – There are three images depicting map scale. Each image is an exact copy of the other except shown to scale. The images were designed to show how detail is lost to provide more coverage area with the greatest scale (1:100,000) versus greater detail and less area covered (1:25,000). I added descriptions and displayed the images in a table to take advantage of organization and alignment.

Lesson 1, Page 4 – There are five graphics on this page that represent the five colors found on a map. Each image was designed to show what each color represents as well as provide a definition. The green image has a tree, grass, and marsh to represent vegetation. The brown image shows a mountain and depression representing contour and elevation. The black image displays examples of items that might be found in black on a map such as: buildings churches, power lines, and roads. The red image displays items that might be found on a map in red such as: marked off populated areas, major roads (highways), and boundaries. The blue image depicts a lake and river representing water. The descriptions and the images flip sides to force the reader to move through the page encouraging them to read the text. Also in each image is the use of typography to help express the meanings of each color.

Lesson 1, Page 5 – This graphic is of a map with marginal data. On the map you will find red boxes that point out hotspots. By moving the cursor over each hotspot a definition and/or an example will be displayed. The intention for this design was to allow the user to interact with
the image. The user is able to choose how much they want to learn on in this section of the lesson. The hotspots also allowed for better use of space. Rather than using a selection image or placing numbers next to each area on the map with a corresponding definition this allows the user to see the entire map while viewing the description.

**Lesson 2, Page 2** – There are two images on this page. The first is an image designed to explain what a grid square is. It shows a portion of a map with a grid square highlighted. To the right are key points about a grid square. They are connected by connectors. This graphic takes advantage of shape tool principals. The second image is of a military protractor. This image explain the different parts of the protractor. It uses clear selection principals by taking advantage of color and contrast.

**Lesson 2, Page 3** – There are two graphics on this page. Both explain in steps how to plot a 4-digit grid coordinate. They were designed to highlight the rule “right and up”. The first graphic shows how to move right on the map and select the correct vertical grid line. The second shows how to move up and select the correct horizontal grid line. Each graphic as the grid square projected from the map to clearly show what grid you are plotting and what digits you are using in each step.

**Lesson 2, Page 4** – There are two graphics on this page. The first was designed to demonstrate the starting point for a military protractor when plotting a 6-digit grid coordinate. The second graphic was designed to explain how to determine the third digit for the right and up portions of the 6-digit grid square. Both graphics take advantage of CARP to guide the user through the steps of plotting a 6-digit grid coordinate.

**Lesson 2, Page 5** – On this page there are three graphics. The first two mirror the images for found on page 4 of this lesson. They are there to reiterate plotting a 6-digit grid before turning it into an 8-digit grid coordinate. The third graphic was designed to explain how to read the protractor cut out for estimating the 8-digit grid coordinate. These graphics take advantage of CARP using color, alignment, and proximity.

**Lesson 3, Page 3** – There are five graphics on this page. Each graphic represents one of the five major terrain features found on a map. All graphics have an image of the terrain feature as seen on the ground and a sample contour line drawing. This allows the user to understand what he is seeing when looking at contour lines on a map and creates a relationship between real and map. These images take advantage of color, selection and contrast. With each graphic is a definition of each terrain feature. This helps to reinforce cognitive learning.

**Lesson 3, Page 4** - There are three graphics on this page. Each graphic represents one of the three minor terrain features found on a map. Like page 3, all graphics have an image of the terrain feature as seen on the ground and a sample contour line drawing. This allows the user
to understand what he is seeing when looking at contour lines on a map and creates a relationship between real and map. These images take advantage of color, selection and contrast. With each graphic is a definition of each terrain feature. This helps to reinforce cognitive learning.

**Lesson 3, Page 5** - There are two graphics on this page. Each graphic represents one of the two supplemental terrain features found on a map. Like page 3 and 4, all graphics have an image of the terrain feature as seen on the ground and a sample contour line drawing. This allows the user to understand what he is seeing when looking at contour lines on a map and creates a relationship between real and map. These images take advantage of color, selection and contrast. With each graphic is a definition of each terrain feature. This helps to reinforce cognitive learning.

**Process Design**

This unit was designed following many of the instructional design principals found in Lohr’s *Creating Graphics for Learning and Performance* (2008). The layout of the pages were designed using the Gestalt principles: Similarity, Proximately, and Experience. Similarity is carried throughout each page to keep experience predictable. The pages are laid out in a grid pattern so the user knows where to find instructions, content and review questions on each page. This easy to follow layout is consistent through the unit (Rowland, 2008). The Experience is improved by the similarity of the pages, but also by making the pages flow with an easy to use navigation. At the bottom of each page there are navigation buttons that allow the user to go to the next page or previous. The buttons let the user know when they have reached the end of the lesson or a practical exercise. An added locator graphic helps the user understand where they are in the lesson. The locator also acts as a navigation feature allowing the user to jump to different parts of the lesson.

Each lesson is designed to build on the previous. There is a start page that provides the unit overview, unit objectives, and introduction to the unit. By clicking on a navigation “next button” the user is taken to page 1 of lesson 1. At the beginning of this lesson like each other lesson you have a lesson overview page. These pages clearly state the learning objectives, materials required, references to help the student, and introduce the lesson.

The user will continue to move through lesson 1 by using the “next button”, learning what a map is, the scales of maps, the colors used on a map, and the marginal data that provides instructions for reading that map. The user will have graphics along with words allowing users
to learn better from both rather than from just words as stated in *Prescriptive Principles for Instructional Design*, by Merril, Barclay, and van Schaak (p. 6).

In lesson 2, the user starts to participate more. Graphics demonstrate how to plot grid coordinates on a map. Each image is designed to show the user how to plot each grid coordinate and also allows the user to follow along. By providing a map to the user, they can stop at any time and test their skills. This incorporates the “Learning by Doing” principal (Merrill, First Principles of Instruction, p. 11).

In lesson 3, the user is exposed to terrain features. Now that they understand how to read a map’s colors and marginal data, and are able to plot a grid coordinate to express a location on a map, they will learn about contours and elevation. This is where the user begins to see the map in 3D. To understand terrain features the user must be exposed to both an illustration of the terrain feature and its corresponding contour line drawing. Only meaningful images are used that help the user understand how each terrain feature will look on a map (Rowland, 2008).

At the ends of Lessons 2 and 3 there are practical exercises that allow the user to put his skills to work. They are designed as peer level training where users participate in helping each other. This form of learning is known to lead to improved conceptual understanding (Nicol & Boyle, 2003).

At the end of the user’s journey through the lessons they are ready to put what they have learned to use in a land navigation training area. Taking the knowledge gained users should be able to plot grid coordinates and recognize terrain features, both on a map and on the ground. These are the first steps of actually navigating from one point on the ground to another.

**References**

