Formative Rubric for Lesson 3—Map Elements

	1	2	3	4
Legend or Key	Legend or key is unable to be read or missing.	Legend or key is messy or distracting from the rest of the map.	Legend or key is easy to find and clear to read. Doesn't distract from the rest of the map. Not so small that it is hard to read.	Legend or key is clear and creative as well. The style of the legend matches the overall style of the map.
Symbols and Labels	Symbols and labels are unable to be read or missing.	Symbols and labels are messy or distracting from the rest of the map.	Symbols and labels are easy to spot and clear to understand.	Symbols and labels are not just clear, but creative as well. The style of the symbols matches the style of the map.
Direction—Compass Rose	Compass rose is unable to be read or missing.	Compass rose is messy, inaccurate, or distracting from the rest of the map.	Compass rose is easy to find and clear to read. It is also accurate.	Compass rose is not just clear, but is creative as well. The style of the compass rose matches the style of the map.
Scale	Scale is unable to be read or missing.	Scale is messy, inaccurate, or distracting from the rest of the map.	Scale is easy to find and clear to read. It is also accurate.	Scale is not just clear, but creative as well. The style of the scale matches the overall style of the map.
Map Grid	Map grid is unable to be read or missing.	Map grid is messy or distracting from the rest of the map.	Grid is easy to understand and clear to read. It isn't so large that it distracts from the rest of the map.	Grid has appropriate spacing between grid lines. The lines are also straight, even, and not distracting.
Map Index	Map index is unable to be read or missing.	Index is messy, inaccurate, or distracting from the rest of the map.	Index is easy to understand and clear to read. It is in alphabetical order, typed, and an appropriate sized font.	Index includes all important locations and features. It is also organized and blends in well with the map. It is not distracting, but is easy to find and easy to read.

DIRECTION
How to Represent Direction

The *compass rose* shows how the direction on a map relates to the direction in the real world. The compass rose uses such as North, South, East, and West. A compass rose is very important when maps are used to travel or find directions to somewhere.

Examples
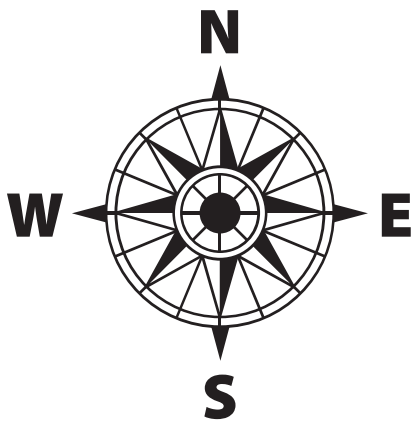
A compass rose may show the four cardinal points of North, South, East, and West. Sometimes they will show intermediate points, such as Northeast, Southeast, Southwest, and Northwest.

Sometimes only North will be given on a map. For this reason, it is very important for us to be able to determine which directions are West, East, and South, based on just North.

Some *important things* to keep in mind when making a compass rose:

- It needs to be accurate

- North is not *always* "up" on a map

- Display of scale should be clear

- As you plan your map, think where you will place the compass rose

- Consider the design of your compass rose

- Look at other compass roses for ideas

A *quality* compass rose is easy to find and clear to read. It is also accurate.

A *high quality* compass rose will often not just be clear, but creative as well. The style of the compass rose may match the style of the map.

KEY AND LEGEND
How to Create a Quality Key and Legend

The *legend* or *key* is the place on the map that shows the important information needed to be able to understand the map. The legend most often includes the definitions of *symbols* used on the map, but sometimes it will also include the scale or compass.

Examples

Legend

⎯	Interstate	⬛	NPDES Facilities
⎯	US and State Highway	▲	Dams
⎯	Local Thoroughfare	☐	ESA Points
⎯	Toll Road	▤	State Boundary
⎯	Ramp	⊥	Public School
+++++	Railroad	⊥	Private School
▭	USGS 100K Index	◆	Airports
▭	Municipal Boundary	▱	ESA
⬳	Water Bodies	▱	Tribal Land
⌇	Rivers	◆	USCG Jurisdiction

Map Legend produced by the EPA Region 1 GIS Center on April 20th, 2006.

Image courtesy of the U.S. Fish and Wildlife Service.

Without a *legend* or *key*, a map reader may have a very difficult time understanding what all of the symbols mean.

Some *important things* to keep in mind when making a legend or key:

- Be clear

- Include examples of the symbols

- Label as "Legend" or "Key"

- Consider using a small border to separate it from the rest of the map

- Remember to include all the symbols your map uses

- As you plan your map, think about the space you will need for a legend

- Consider typing the text in your legend

A *quality* legend or key is easy to find and clear to read. It shouldn't be so large that it distracts from the rest of the map, but it shouldn't be so small that it is hard to find or read.

A *high quality* legend or key will often not just be clear, but creative as well. The style of the legend might match the overall style of the map.

MAP GRID
How to Create a Quality Map Grid

The *map grid* is a set of vertical and horizontal lines overlaid on the map. Not all maps use a *grid and index*, but it is very useful if the map will be used to find locations. A grid and index is common in an atlas and on road maps. Sometimes maps will use *latitude and longitude*, but smaller maps use a more basic grid with numbers and/or letters.

Example

A location on a map can be identified by following the intersection of the rows and columns. If a map maker wants to display where *San Salvador* is, the map maker would look at the top and side of the map to see that it is in the grid where B and 2 intersect. In the *index*, San Salvador would be listed as B2.

Some *important things* to keep in mind when making a legend or key:

- Be clear

- Make the grid lines light enough to still be able to read the map

- Consider using a lighter color for the grid lines

- Label the top, bottom, and sides of the grid

- Use a ruler to measure out the grid spacing before drawing the lines

A *quality* grid is easy to understand and clear to read. It shouldn't be so large that it distracts from the rest of the map.

A *high quality* grid will have appropriate spacing between grid lines. The lines will also be straight, even, and not distracting.

MAP INDEX
How to Create a Quality Map Index

The *map index* helps the map reader find a specific location. A map with an index often uses a *grid*. The reader can look at the index for a listing of locations contained on the map.

Example

Index

- Española—C3
- Fernandina—A2
- Genovesa—C1
- Isabela—B2
- Marchena—B1
- Pinta—B1

- San Cristobal—D2
- San Salvador—B2
- Santa Cruz—C2
- Santa Fe—C2
- Santa Maria—C3

Notice that the index is in *alphabetical order*, so it is easy to look up the name of the place.

The numbers next to the names of the cities are *coordinates*. These help the map reader find the city by using the *map grid*.

Some *important things* to keep in mind when making a legend or key:

- Be clear

- Make the list in *alphabetical order*

- It is best to type the index and then apply it to a map

- Label the Index

- While planning your map, consider where you will place the index

A *quality* index is easy to understand and clear to read. It is in alphabetical order, typed, and an appropriate size font.

A *high quality* index includes all important locations and features. It is also organized and blends in well with the map. It is not distracting, but also easy to find and easy to read.

SCALE
How to Represent Scale

The *scale* shows the map reader how the distance on the map compares to the distance in the real world. If a map is *to scale*, real world distances can be calculated using the map. If a map is *not to scale*, you could use a map to find where something is, but not exactly how far. For example, on a map of stores in a mall, you may not care how many feet away your favorite store is, you probably just care about going in the right direction.

Examples

1:25,000

Numerical

Scale is shown as a ratio. In this scale, every 1 foot on the map equals 25,000 feet in the real world. Maps that show large areas (world maps) often use numerical.

One inch to one mile

Verbal

This scale tells you how the measurements on the map match the real world. If you measure 3 inches on the map, it is 3 miles in reality.

0   1   2

miles

Graphical

With a graphical scale, a distance is placed on the map and converted to real world distance.

Some *important things* to keep in mind when making scale:

- It needs to be accurate

- Include the unit of length if using verbal or graphical (miles, feet, etc.)

- If a map is going to be "to scale" it must match the real world

- Display of scale should be clear

- As you plan your map, think of the space you will use to place your scale

- Consider typing the scale or use a ruler when making a graphical scale

A *quality* scale is easy to find and clear to read. It is also accurate.

A *high quality* scale will often not just be clear, but creative as well. The style of the scale might match the overall style of the map.

SYMBOLS AND LABELS
How to Represent Places

Symbols and *labels* help the reader to identify important locations or information on a map. *Symbols* are graphics that represent something on a map. Symbols can be simple shapes, colors, patterns, or icons. *Labels* are words that identify something. Labels can show the name of a street, city, or river. Sometimes symbols have a label.

Examples

Map Symbols			
🛡	Interstate highway	⬠	U.S. highway
(23)	State highway	626	County route
34	Interchange	☐■	Town or park
■●	Buildings	☐	Specific building
☐	Parking lot	⬭	Quarry, road cut, or borrow pit
⟋	Pullover or parking area	X	Collecting site
‖‖‖	Large bridge	▌▐	Small bridges
┼┼┼┼	Railroad	✦	Hiking trail
⊕	North	⊗	Mine
▲	Camping area	▭	Scale

The map maker decides on what symbols are used on the map, but they are explained in the *key* or *legend*.

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A *label* simply provides the words to identify a specific place on a map. When there are multiple cities, rivers, or other places, labels are helpful.

Some *important things* to keep in mind when making a compass rose:

- Symbols and labels should be clear

- Symbols should be distinct enough that they aren't confused with other symbols

- Only provide labels and symbols for parts of the map that are important to the reader

- As you plan your map, think of what you need to label or identify

- Look at other maps for symbol ideas

Quality symbols and labels are easy to spot and clear to understand.

High quality symbols and labels will often not just be clear, but creative as well. The style of the symbols may match the style of the map.

Name: _____   Date: _____   Per.: _____

MAP ELEMENTS POSTER DIRECTIONS
Create a Poster Explaining Your Map Element

Read the handout describing your map element. *Discuss* the element as a group to answer the following questions. *Create* a poster about your element and be ready to share!

1. What is your group's *map element*?

2. What is the *purpose* of this map element?

3. Why is this map element *important*?

4. How do you make a *clear* and *quality* example of this element?

5. When would a map *not need* this element?

Create your poster

Your poster must include:

- The *name* of the element
- A *large example* of the map element
- The *definition* and *purpose* of the element
- Tips on how to make a *very high quality* example

Name: _____

Date: _____

Per: _____

BLANK MAP

Apply *legend* or *key*, *compass rose*, *scale*, *grid*, *index*, and *symbols* and *labels* to this map. This is your chance to show that you can create all the elements of a map. On this map 1 inch is equal to 355 miles.

Name: _____   Date: _____   Per.: _____

MAP DESIGN EXIT TICKET
Show Your Thoughts on Map Design

You have learned about the important parts of a map. *Reflect* on what you have learned. *Consider* what you still want to know. *Answer* the questions below.

1. Can you make your own map from scratch?

2. What other *tools* or *materials* would help you make a map?

3. What is your *favorite element*? Why?

4. What else do you *need to know* in order to make your own map?