Information about the Quiz format, and some basic details can be found in the last slide from the [Week 5.3 lecture. Preview the documentView in a new window](https://canvas.uw.edu/courses/1066006/files/38675604/download?wrap=1)

Below, I've offered my own interpretation of my lectures for the sorts of things that I think would be useful for you to be able to speak to within the exam. The exam will certainly cover less than the whole scope of the items mentioned below--we only have 50 minutes! But the exam may also cover some of these topics in greater depth or examine topics not covered here--as noted elsewhere, all material assigned is fair game. Nonetheless, I'm hoping this is a very useful and solid starting point for you.

As you are reading the topics below, keep a few things in mind: You want to be able to explain some terms, but make sure your words aren’t empty to you. You’ll need to be able to think through some examples—both by offering examples but also by analyzing new situations that I give you. It’s important to be able to speak to some basic tradeoffs and advantages of doing something in one way versus another.

The numbers in parentheses correspond to a few entry points to the topics within the lectures. "1.2" means Wednesday of Week 1. "4.1" means Monday of Week 4.

I'll be happy to discuss any of these on Monday! Try to bring something more detailed than just the question itself, though--be ready to talk about what you were thinking about it. If they aren't clear, I can clarify them before then, too--drop me a message. Best of luck!

* **What are some ways of defining what GIS is? (1.1, 1.2, and readings)**

A GIS is a toolbox

A GIS is an information system

GIS is actually a type of science

* **Be able to distinguish between phenomena and data in the context of GIS and mapping (esp. Week 2.1).**

Data is a model of phenomena

* **What are some advantages of using a layer approach to representing the world? What does a layer approach render less accessible to our analyses? (esp. Week 2.1)**

Map overlay and conceptually related analysis

Every act of representation has consequences: after it’s been done, you are more able and likely to follow it up with some types of analysis and visualization and conclusions than with others

* **Be able to differentiate and discuss the two aspects of GIS data: spatial and attribute. (esp. Week 2.1, but elsewhere, too, such as in this past week’s lectures and readings.)**

Spatial Data

Location: 1. Where is it located? 2. What shape is it?

Attribute Data

Qualities: 1. What is it? What ways can we describe it?

* **What are ‘features’? (esp. 2.1)**
* **What types of geometries are generally available for use when composing basic [vector] GIS features and layers? (esp. 2.1)**
* **For some phenomenon I give you, which types of geometry might you use to model it and why? For a geometry, can you give examples of phenomena that it would be useful to model? (esp. 2.1)**
* **Be able to differentiate between data whose spatial character is discrete versus continuous. Same thing for phenomena. Can you think of times when you would model a continuous phenomenon discretely in data (or a discrete phenomenon using a more continuous approach in data?) How and when can you convert between spatially discrete and continuous data?  (mainly 2.1)**
* **Levels of measurement. What are they? What do they have implications for? Understand their cumulative/hierarchical nature. Understand how different visual variables and thematic mapping approaches are appropriate to expressing the different levels of measurement of data. (discussed in multiple classes.) What sorts of questions can be answered with data of what levels of measurement? What sorts of comparisons or mathematical operations are valid on data of what levels of measurement?**
* **“The map is not the territory”: What does this mean? (2.2)**

The map is a glimpse/perspective of the territory, but is not the territory itself

* **What is a general reference map? What is a thematic map?**
* **What is symbolization? Is this what I think it means: visual variables?**
* **How do the four types of thematic maps on p.9 of Week 2.2 differ (also those of Slocum et al. 2005’s Section 4.4)? What sorts of visual variables do they use? For a given type of data, which of these thematic mapping approaches would be more appropriate or inappropriate? Choropleth vs. proportional symbol maps? (4.1)**
* **What does Mark Monmonier’s quote, “Not only is it easy to lie with maps, it’s essential...” mean? (see Week 2.2). Can you give an example of where that might apply?**
* **Visual variables. What are they, in general? Know the ones we have talked about. How are they used? In what sorts of data or situations are each of them more effective to use?**
* **When visually expressing the distinctions among nominal data by using differences in color, when do you want the differences among the colors to all seem equal? When do you want some differences to seem smaller than others? (for example, see Week 2.3, p.12).**
* **What are some different ways you could describe a color?**
* **What is Hue? Saturation? Value?**
* **What is a color model?**
* **What is a color space?**
* **What is a perceptually uniform color space? Give an example of when they are useful in mapping and why.**
* **Which do we have an easier time differentiating more gradations of: saturation or lightness? Lightness…?**
* **Are there visual differences that are not as distinct for some people as for others? Which?**

Color blind people

Saturation vs. Lightness

Choosing the wrong color scheme for your purpose (qualitative, sequential, diverging/converging)

* **When do cultural connotations of color matter and why?**
* **Can you give an abstract definition of ‘classification’, discussing what it is and what it does? Can you give a concrete example of when you might want to use it and with what effects? Can you imagine examples when classification is not appropriate?**
* **What are some specific methods of classification? If I had ratio data, can you tell me a method of classification that would help me convey those ratio relationships on a map? What about interval data? What are considerations that lead you to choose one method of classification over another? (esp. 3.3)**
* **What does it mean to say that maps have perspectives or standpoints? (3.2, but also Wood readings, 2.2, 2.1, and others.)**

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* **What is standardizing data? When might you want to do it? What sorts of maps often use standardized data? (4.1)**
* **What are some ways of describing location, generally? How does GIS tend to represent location, in particular? (esp. 4.2)**
* **What are coordinates? What is a coordinate system? (esp. 4.2)**
* **Georeferencing and geocoding: what are they? Can you give some examples of when you use them? (note: Week 1.3 class, Hawaii map, and Longley et al. Chapter 5)**
* **Why can we use 2D coordinates on a 3D earth? (esp. 4.2)**
* **Why do we use 2D maps of a 3D earth? (esp. 5.1)**
* Our computer displays and maps are usually flat.
* • Spatial computation is simplified by using Euclidean geometry,
* not spherical geometry.
* • We are only starting to have good 3D data.
* **What is a ‘projection’? What is being projected to what? (esp. 4.2)**
* **What is a reference globe? What is a developable surface? What are terms for different ways of configuring them and their relations to each other: conical vs. planar vs. cylindrical; secant vs. tangent; equatorial vs. oblique vs. transverse/polar? (5.1). You don’t need to know examples of each or why they’re important—with the possible exception of Transverse Mercator (especially in the form of UTM from 5.2). You mainly need to have a sense for what geometrical relationship between globe and developable surface is being implied in each, which also should let you be able to articulate where on the earth each should be minimizing the distortion of the resulting projection.**
* **What perspective does ‘analytical cartography’ take on the use of projections?**
* **What ‘properties’ can a projection ‘preserve’? (What does that even mean?) What does it mean to say a projection is equivalent? Conformal? Equidistant? Are there projections that are all of these at once, perfectly? Are there ones that come close? (5.1, associated readings)**
* **What is a mapping situation when you can come close to not having distortions coming from your projection? Can you give an example of a projection that you could use in such a situation? (5.2, associated readings)**
* **What is a datum, when do you use one, and why should you care? (5.2, but explained more in the associated readings).**

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* **What are data models? What are the main types of data models we’ve discussed in class?**
* **In broad strokes, how do vector and raster representations differ? Can you give an example of how that might matter to how you represent a particular phenomenon in data? Can you give an example of a phenomenon that you think would be best represented in vector? In raster? Through either, depending on situation (what kind of situations?)**
* **Among vector data models, what is a spaghetti approach? What is a topological approach? What does each allow you to do more easily than the other? Can you imagine situations where these differences likely matter, such that it is better to use an analytical tool and/or data structure where topology is [or is not] taken into account?**
* **What can ‘topological rules’ do? Can you give some examples of what such rules might be?**
* **What is a ‘planar topology’? When is it a desirable thing to have in GIS data?**