

Brianne Wold and Pierre Gamache
Geocaching lesson

Standards:

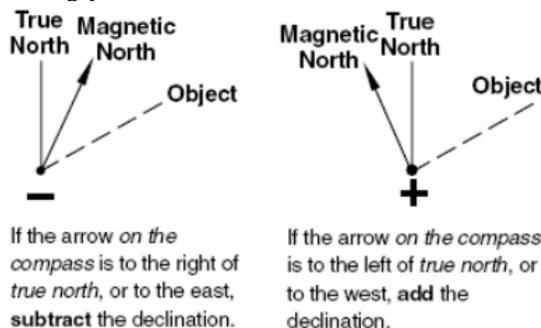
- Magnetic fields and forces
- Earth interacts with various extraterrestrial forces and energies such as gravity, solar phenomena, electromagnetic radiation, and impact events that influence the planet's geosphere, atmosphere, and biosphere in a variety of ways
- The theory of plate tectonics helps explain geological, physical, and geographical features of Earth

Day One:

- overview of Earth's magnetic field
- magnetic and iron filling to demo mag field
- plotting exercise with historic coordinates featuring adjustment for the magnetic field variations in different locations
- what is GPS? How does it work? Satellites and orbits

Day Two:

- compass at North Pole video
<http://www.youtube.com/watch?v=wjGr7legCVY>
- Intro activity of using a compass reading, what it means, "red in the shed"
- True North and Magnetic North
- Slides on right ascension and declination and video explanation
<https://www.youtube.com/watch?v=hqPtMqw6CSo>
- The method for correcting for declination is as follows:
 1. For Easterly Declination, subtract the declination from the true reading to obtain the magnetic reading. $\text{Magnetic} = \text{true} - \text{easterly declination}$
 2. For Westerly Declination, add the declination to the true reading to obtain the magnetic reading. $\text{Magnetic} = \text{true} + \text{westerly declination}$. An easy way to remember whether to add or subtract is "West is best and East is least." So for West declination, add to the true reading (West is best, and therefore a larger number) and for East declination subtract from the true reading (East is least, and therefore a smaller number).



Day Three:

- Mini measurements and conversions recap (absolute and estimates – steps vs. inches)
- Intro to Geocaching (what it is,

- How to use topography and reading a map

Day Four and Five:

- Final assessment: 3-4 different groups with different routes. Will use both a compass and GPS unit. Grade based on how many treasures/caches found out of their total.
- Will address the learning targets of:
 - reading a map
 - identifying topographical landmarks
 - using a compass correctly
 - comparing it to GPS and satellite triangulation
 - magnetic fields (how it may affect their route)
- Create their own route and publish on the geocaching website for their area for the next year's class to do. <http://www.geocaching.com/>

Reflection paper to satisfy the writing standards across curriculum as well as check for understanding to see if they had a good grasp on the concept by summarizing. This could go along with math standards too with the measurement applications.