Outdoor Skills Lesson Plan for
Geocaching and Orienteering

PARTY Grant funded by Resource Enhancement and Protection Conservation Education Program (REAP-CEP) & Polk County Conservation

Goal: Participants will gain experience and understanding of how to use a GPS unit and compass**.** Participants will learn about geocaching.

Objective:

1. Students will be able to find the four cardinal directions using a compass.
2. Students will be able to read compass degrees and follow a set-up course.
3. Students will be able to use a GPS unit to find at least three caches.

Materials: 30 compasses, flagging to set-up compass course, copies of compass routes for participants, 10-20 Garmin eTrex GPS units, three treasure-filled caches, big outside open space to hide the caches

Season: Fall, Spring and Summer work best

Time: 2 hours

Information

Part 1 – Using a Compass

History of Compasses

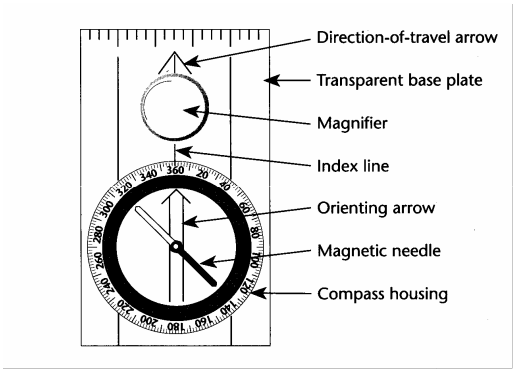
- The first compass was invented by the Chinese almost 2,000 years ago.
- A compass is a navigational instrument for finding directions on the earth. The magnetic needle aligns itself with the Earth's magnetic field.

Compass Directions

- Four cardinal directions are north, east, south, and west.
- Compass directions (north, east, south, and west) are also read in degrees, like the degrees of a circle. North = 0 or 360 degrees, south = 180 degrees, east = 90 degrees, and west = 270 degrees. These degrees which tell us a certain direction are also called *bearings*.

Parts of Compass

- Magnetic needle
- Orienting arrow
- Compass housing unit (dial)
- Direction of travel arrow
- Base plate



Tips on using a compass

- Directly face the object to which you are measuring the bearing.
- Keep the compass level (parallel to the ground). Tilting keeps the needle from swinging freely.

- Hold the compass directly in front of you, not at an angle.
- Hold compass close enough so you look down on the face, not sideways at it.
- Keep compass away from metal objects.

Setting a Bearing (azimuth)

- Turn housing unit or dial so the bearing is set at the index line. (East would be a bearing of 90 degrees.)
- Turn body and the compass as one, until the red end of the magnetic needle is aligned with the "N" on the dial or aligned inside the orienteering arrow (red dog in the doghouse).
- To follow this bearing, sight a landmark with the direction of travel arrow and move along that line.
- No need to look at compass while walking, the landmark keeps you on course, not alignment of the needle on the compass

Measuring a Bearing (azimuth)

- Point direction of travel arrow towards a landmark.
- Find bearing to the landmark by turning the dial until the red end of the magnetic needle is aligned with the "N" on the dial or aligned inside the orienteering arrow (red dog in the doghouse).
- Read bearing at the index line.

PART II – Using a GPS

History of GPS

- The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense. GPS was originally intended for military applications, but later on the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS. Basically GPS allows you to determine your location and find other locations on earth.

How is GPS used?

- Military
- Airplanes
- Boaters
- On-Star in vehicles
- Tracking stolen vehicles
- Locating a cell phone of someone who is lost or injured
- Surveying land
- Agriculture
- Hunting, fishing, canoeing, biking, camping
- Geocaching (A game where individuals hide caches all over the world and share the locations of these caches on the internet.) GPS users can use the location coordinates to find caches. Once found, a cache may provide the visitor with a wide variety of rewards.

All the visitor is asked to do is if they take something they should leave something behind in the cache.)

Limitations

- Only accurate to 30 feet or so.
- There must be a relatively clear "line of sight" between the receiver's antenna and several orbiting satellites. Anything shielding the antenna from a satellite can potentially weaken the satellite's signal to such a degree that it becomes too difficult to make reliable positioning.
- Will not work indoors.

Features of a GPS

- Satellite page – shows signal strength with satellites
- Map page – shows map of where you are
- Navigation page – shows compass face and direction you are traveling
- Trip odometer page – shows distance traveled, move time, stop time, and more
- Menu page – shows mark, waypoints, tracks, and set-up functions

Finding Geocaches

Follow the navigation arrow and watch the distance to the waypoint. Once you are in 30-40 feet of the cache, start looking! Take one object out of each container.

Environmental Issues

- Litter
  - Pollution of land
  - Recycling
- Habitat loss
  - Space/development issues
  - Deforestation
  - Wildlife management

Additional Resources

Polk County Conservation - www.leadingyououtdoors.org
11407 NW Jester Park Drive
Granger, IA 50109
515-323-5300

Geocaching Reference - www.geocaching.com
Silva Compasses - www.silvausa.com

Direction Relay Game

Objective: To learn the 16 traditional compass directions. N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, NNW.

Prep: Take 16 flashcards and write one of the traditional compass directions on each. To make enough flashcards for an entire class, make two sets of flashcards.

Instructions: Mix up one set of flashcards and lay them face down in a circle, and then make another circle with the other set of flashcards. Designate the top of the circle as North. Divide the class in two groups. Explain to the students this is a compass and you need to put the directions in the right places. Have one student from each group come up to their circle and pick up a flash card from the circle. He/she should look at the direction on the card and decide where it goes on the compass. He/she will lay the flashcard down where another card already lays. He/she should pick up that card and bring it to the next student in line. That student must then decide where their flashcard goes in the compass. The first team to complete the activity correctly wins.

Optional Activity: Make two sets of flashcards with the compass directions in degrees. 0, 22.5, 45, 67.5, 90, 112.5, 135, 157.5, 180, 202.5, 225, 247.5, 270, 292.5, 315, 337.5. Do the same activity above.