



## GRADE LEVEL

Grades 5 -9

## TIME FRAME

3 hours

## MATERIALS

- Compasses and maps (at least 1 of each per pair of students)
- Large example compass
- Example way-point marker
- Whistle
- Laminated group cards

See "Materials Breakdown" at end of lesson plan for detailed explanation.

## LOCATIONS

- Start at campus course
- Go to either
  - West prong course (easy)
  - Bull branch courses (easy & difficult)

## CROSS-CUTTING CONCEPTS

*Systems and System Models*

Students observe maps and use them for navigating through a landscape.

## IDEAL SEASONS

Any season

INVITE



EXPLORE



WONDER



CREATE



REFLECT



SHARE



## LESSON SUMMARY

Students step away from maps on a screen and learn to use a map and compass. They use the new skill to search for clues in the woods that help solve a puzzle. They might even stumble into some interesting nature observations along the way!

Guiding question: What skills do we need to navigate in the woods?

## KEY LESSON CHARACTERISTICS

WHAT LEARNERS DO	SKILLS & KNOWLEDGE	SOCIAL & EMOTIONAL ABILITIES
Hike in the woods and off-trail	Reading a map and compass and using them to navigate	<b>Relationship Skills</b> Stay together and work with others in challenging situations
Navigate with a map and compass	Reading the landscape	<b>Responsible Decision Making</b> Keep self and group members safe in the woods
Work with a group of peers to find navigational way-points		

## LESSON FLOW



FIND YOUR NATURALIST (OPTIONAL)



INTRODUCTION TO MAPS AND COMPASSES



CAMPUS COURSE



WOODS COURSE



WRAP UP



# WILDERNESS NAVIGATION

## FIND YOUR NATURALIST (OPTIONAL)

~15 MIN

### ALTERNATE INTRO

With some groups a discussion of wilderness might be a suitable introduction. See the HS Wilderness Navigation curriculum for more details.

### CO-TEACHER CHECK IN

- Communicate with the teachers beforehand and ensure they feel confident facilitating the students as they locate the new meeting spot.
- Check in with the teacher afterward to see how the students did with the map as a form of pre-assessment. This could inform how in depth you go with later content.

### OPTIONAL CO-TEACHING

Split into two groups with each co-teacher leading one part. Part 1) introduction of the map and the map's key. Part 2) introduction of the compass and its parts.

### COMPASS SAFETY

Explain how to respect the equipment. Don't swing it around, always wear it around your neck.

### WHERE'S NORTH

Emphasize that the red arrow always points north. Many students get confused thinking that the red arrow points to their direction of travel.

### TAKING A BEARING

If the students catch on quickly, you might consider teaching them to take a bearing on their compass. Step by step instructions to do this can be found in the additional information.

1. Leave a note and a few maps at your meeting location indicating that the class will need to find you in a different location. They will need to use the campus maps and the note to locate you.

2. When students get to the meeting spot ask them a few turn and talk questions.

- What did it feel like to use a map?*
- What were some clues from the map that helped you find me?*
- Did anyone disagree? How did you handle that?*
- Right now, how do you feel about navigating in the woods with a map and compass? (This is a good time to clarify questions and calm fears that the students have. Pay attention to the overall group attitude.)*



*"Now that we've gotten to experiment with our map a little bit, we're going to take a closer look at the materials that are going to help us navigate the woods today."*

## GETTING ORIENTED

20 - 40 MIN

### INTRODUCTION TO MAPS

- Make sure each student is able to closely observe one of the maps.
- Ask students to use the key to find familiar, and eventually, unfamiliar places around Tremont. (Don't go to those places, simply locate them on the map)

### INTRODUCTION TO COMPASSES

- Give students a few minutes to explore their compasses and make predictions about what the different parts do.
- Using the large example compass to name all the different parts of the compass. Include north arrow, base plate, dial, orienting arrow, direction of travel arrow.

### USING MAP AND COMPASS TOGETHER

- As a whole group, ask them to combine the map and compass and challenge them to...
  - Orient the map so that north on the map is north in real life.
  - Based on the map, point at the direction of certain numbers from the meeting spot.
  - Describe what sorts of landmarks are around the given destination that they might look for.
  - Approximate distance based on the scale to any given destination

# WILDERNESS NAVIGATION

## GROUPING

Groups should be no larger than 5 students. Decide beforehand if you will let them choose their own groups or if you will choose random groups. For most classes random grouping is suggested.

## CHECK IN

Bring an example card so that the student can visualize what they're looking for.

## WHILE THE STUDENTS ARE NAVIGATING...

- Stay in an open place where the students would be able to find you and where you can see (the field is a great place to stay)
- Watch the groups to make sure that they stay together
- Watch to see if any groups need extra support, if they do suggest a chaperone or teacher tag along with that group.
- Keep an eye on the time, even if not all the groups finish make sure you have time to get to the Woods Course

## NOTES ON TIMING

Much of the timing depends on how well your group understands using the map and compass. Try to leave at least an hour for the Woods Course and debrief. It's okay if groups don't finish the campus section before moving on

## WOODS COURSE BOUNDARIES

West Prong - way-points are found within or near the West Prong/Cemetery Loop. Place an adult at the far junction of West Prong/Cemetery trails.  
Bull Branch - way-points are generally near the stream. Send an adult up the branch.

## CAMPUS COURSE

30 - 45 min

1. Assess the students and their comprehension of the map and compass. When you feel like they are beginning to grasp it, divide into groups and introduce the Campus Course and rules.

▶ *"Find the numbers 1-5 on the campus section of your map. At each number should be a card attached to a tree. Don't take the card, but rather record information from the card. Each group will have a letter associated with it, each group should record the letter on the card that corresponds to their group letter. At the end of the Campus Course you will have 5 of 10 letters that you unscramble to get your final word."*

## THE RULES

- 1) The group should always be together, do not split up.
  - 2) Stay within the boundaries (don't cross the bridge and don't go down any trails or in any buildings).
  - 3) Walk.
  - 4) If they feel lost stay in one place and yell out every once in a while.
  - 5) When they hear the whistle they need to return to the meeting place.
2. After the campus course and before heading to the Woods Course, take a few minutes to debrief the Campus Course.
    - *How did your group work together? What different roles did group members play?*
    - *What was a moment when your group struggled? What did you do to overcome that?*
    - *What was a successful moment for your group? What made it successful?*
    - *What is something that your group can work on during the Woods Course?*

## WOODS COURSE

45 - 60 MIN

1. Explain that some groups will find numbers that have  $\triangle$  and some will find numbers that have a  $\bigcirc$ . Make sure that they find the points that match their groups card so they can get the right letters to unscramble.
2. Place the chaperones and teachers that aren't tagging along with groups in strategic locations around the course.
3. Call the students back with at least 20 minutes left in class, it will take them a while to return to the starting point.

## AVAILABLE COURSES

- Woods Courses are found at the West Prong/Cemetery area and Bull Branch. They operate under the model listed above (finding numbers with  $\triangle$  or  $\bigcirc$  and unscrambling a word) and are the standard/beginner course.
- Advanced Course is found only at Bull Branch. Groups find numbers (there are no  $\triangle$  or  $\bigcirc$ ) and write down sections of a quote that they can piece together at the end. This is recommended for older students.
- Materials needed for each of these courses are found in the additional information section.

# WILDERNESS NAVIGATION

## SUCCESS

This may sound like unorganized chatter with students talking over one another, but that likely means students are excited about their experiences. Allow some of this unstructured sharing time.

## WILDERNESS WRAP UP

The wilderness wrap up will be more successful for older students that have completed the advanced course and if the class discusses wilderness before completing the courses.

### WRAP UP OPTION ONE (TEAMWORK)

~20 MIN

1. Allow the students some time to chat with other groups and share the stories from their time in the woods. Ask some students to share their story with the whole group.
2. Get group's attention and ask a few turn and talk questions.
  - *Why do you think your teachers might have wanted you to do wilderness navigation? What can we learn from it? What did you learn from it?*
  - *Find a student that helped you out today and tell them thank you and why you are thanking them.*

### WRAP UP OPTION TWO (WILDERNESS)

~20 MIN

1. If students have done the advanced course, allow them to share they quotes that they pieced together.
  - *What do these quotes tell us about wilderness?*
  - *What is the importance of preserving wilderness?*
  - *Do you agree or disagree?*
2. Share definition of wilderness as found in The Wilderness Act.
  - *"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognised as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."*
  - *Does this mean that in order to preserve wilderness we must keep humans out of it?*
  - *How do you interpret this definition?*
  - *Would you change it? How?*

**Be sure to get all the materials back from students before they leave.**



## BRING IT HOME

- Many student have heard of "geocaching". Geocaching is a popular activity where people use a GPS (often a smartphone works), to navigate and find hidden caches. This happens all over the world and is a good way for students to keep using navigational skills.
- Map making: After spending time with maps, students can try to make a map of a place they know well. When they go back to this place they can check their map and see how accurate it is.

# WILDERNESS NAVIGATION

## SKILLS

To build their own orienteering course, the students will need to understand how to take a bearing and how to measure distance with pacing (both found in the additional information).

## ADDITIONAL ACTIVITIES

### BUILD YOUR OWN ORIENTEERING COURSE

*Students use their navigational skills to create their own course. Recommended for advanced groups.*

**Required materials:** *Miscellaneous objects; compasses; journals*

1. Set up a series of random objects around the field.
2. In groups, students determine a route between these objects. They write down the bearing and number of paces to get from one object to another.
3. Each group trades with another and attempts to find the objects in the right order.

### MY SECRET PLANT

*Students use journals to create maps and follow peers' maps.*

1. Give the student boundaries and instruct them to find a secret plant. On one page of their journal they should sketch the plant and on the next page they should create a map of the surrounding area that will help lead another student to their secret plant. Discuss helpful details to include (landmarks, rivers, ponds, large trees, hills).
2. After students finish their sketch and map, they should come back to the meeting spot and trade journals with another student. Using each other's journals the students will try to find each other's plants
  - *What features did your partner add that helped you find their plant?*
  - *If you were to find another plant and do this again what would you change?*
  - *What was something that you noticed about your plant while you were sketching?*

### UNDERSTANDING CONTOUR LINES

*Students use their hand to understand how contour lines depict the mountains.*

1. To help understand topographical maps, students imagine that their knuckles are mountains. With your hand in a fist draw circles like a bulls-eye around the "mountain".
2. Flatten your hand. The circles left behind indicate where the knuckles.

## MY SECRET PLANT

This is activity from John Muir Laws that is written up with more detail as a co-teaching quick guide.

# WILDERNESS NAVIGATION

## ADDITIONAL ACTIVITIES

### MAP MAKING

This activity is also found in the "Bring It Home" section.

### MULTIPLE GROUPS

If multiple groups are playing at one time, be sure to have a signal and meeting location for when the game is done.

### HEAD START ACTIVITY

As hounds are waiting for the foxes to get a head start, challenge them to find different bearings, practicing their compass skills.

### HOWLING HOUNDS

Hounds may howl as they search. This puts pressure on the foxes to move quicker.

### MAP MAKING

*Students think of an area they know and create a map of that space.*

1. Students use either natural materials or pencil and paper to make a map of an area they know well. Note what different landmarks are included and what is helpful for navigation in different spaces.
2. If student do this activity in their journals they can compare it to the place that they have mapped.

### FOXES AND HOUNDS

*Students use their compass skills to leave and follow clues about where their classmates have gone.*

**Required materials:** *paper and pencils; compasses*

1. Split the class into an even number of groups (each group with an adult). Designate half of the groups to be foxes and the other half to be hounds.
2. Foxes choose a bearing to follow, write it on a piece of paper, and walk that direction. Each time they start walking in a new direction they should figure out the new bearing and write it on a piece of paper and leave it on the ground. Foxes choose five different directions and hide somewhere after the fifth direction.
3. Hounds give foxes a five minute head start and begin following the bearings left as clues by the foxes. When they get to the 5th piece of paper they should begin searching for the foxes. When the foxes are found the groups switch roles and begin again.



# WILDERNESS NAVIGATION

## Wilderness Navigation Field Card

### Find Your Naturalist

1. Leave a note and map at your meeting location telling students where to find you. Students follow the map to find you

- *What did it feel like to use a map?*
- *What were some clues from the map that helped you*

**?** *find me?*

- *Did anyone disagree? How did you handle that?*
- *Right now, how do you feel about navigating in the woods with a map and compass?*

### Getting Oriented

#### INTRODUCTION TO MAPS

1. Ask students to use the key to find familiar, and eventually, unfamiliar places around Tremont.

#### INTRODUCTION TO COMPASSES

1. Using the large example compass to name all the different parts of the compass. Include base plate, Dial, North Arrow (Red), orienting arrow (Shed), direction of travel arrow (Fred).

#### USING THE MAP AND COMPASS TOGETHER

- Orient the map so that north on the map is north in real life.
- Based on the map, point at the direction of certain numbers from the meeting spot.
- Describe what sorts of landmarks are around the given destination that they might look for.
- Approximate distance based on the scale to any given destination
- If students grasped the map and compass quickly you can teach how to get a bearing on the compass

## Wilderness Navigation Field Card

### Campus Course

1. When you feel like they are beginning to grasp it, divide into groups and introduce the Campus Course and rules.

#### THE RULES

- The group should always be together, do not split up,
- Stay within the boundaries (don't cross the bridge and don't go down any trails or in any buildings.)
- Walk.
- If they feel lost ,stay in one place and yell out every once in a while.
- When they hear the whistle they need to return to the meeting place.

2. After the campus course, debrief before heading to the woods course.

- *How did your group work together? What different roles did group members play?*
- *What was a moment when your group struggled? What did you do to overcome that?*

**?**

- *What was a successful moment for your group? What made it successful?*
- *What is something that your group can work on during the Woods Course?*

### Woods Course

1. Explain that some groups will find numbers that have △ and some will find numbers that have a ○.
2. Place the chaperones and teachers in strategic locations.
3. Call the students back with at least 20 minutes left in class

#### Wrap Up

- *Why do you think your teachers might have wanted you to do wilderness navigation? What can we learn from it? What did you learn from it?*

**?**

- *Find a student that helped you out today and tell them thank you and why you are thanking them.*

# WILDERNESS NAVIGATION

## AGE CONSIDERATIONS AND STANDARDS

### 4th - 5th

#### AGE RELATED TEACHING TIPS

- Consider sending an adult with each group. Ensure the adult isn't doing the navigating, but is merely there to monitor safety.

#### RELATED STANDARDS

- SSP.06 (Social Studies Practice): Develop geographic awareness by determining the use of diverse types of maps based on purpose.

### 6th - 8th

#### RELATED STANDARDS

- SSP.06: Develop geographic awareness by analyzing locations, conditions, and connections of places and use maps to investigate spatial relationships.

### 9th - 12th

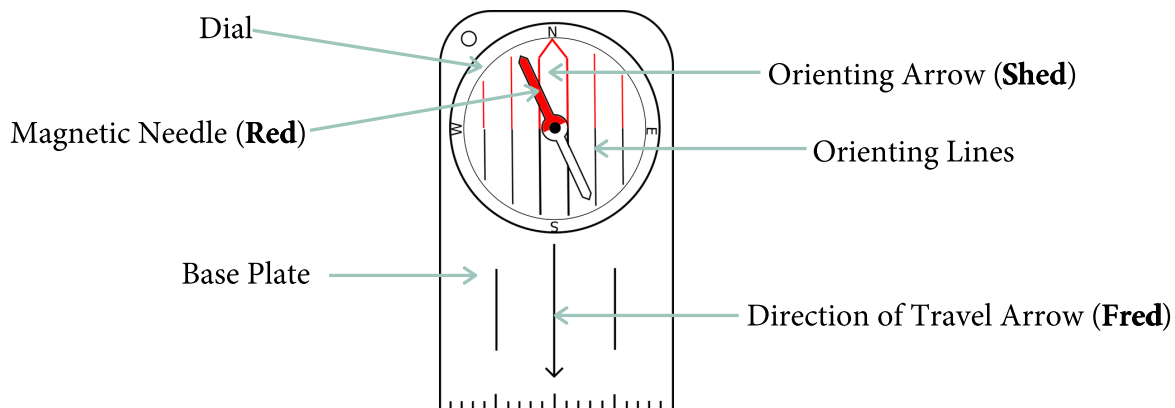
#### AGE RELATED TEACHING TIPS

- The navigation and group work may come fairly easily to students. Be prepared with some of the additional activities and longer debrief options.

## ADDITIONAL INFORMATION

### ORIENTEERING COMPASS

A compass works by interacting with the earth's magnetic poles. The strong magnets in the earth's core attract the magnetic needle and show us where the magnetic poles are.





# WILDERNESS NAVIGATION

## ADDITIONAL INFORMATION

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### TAKING A BEARING USING A MAP AND COMPASS

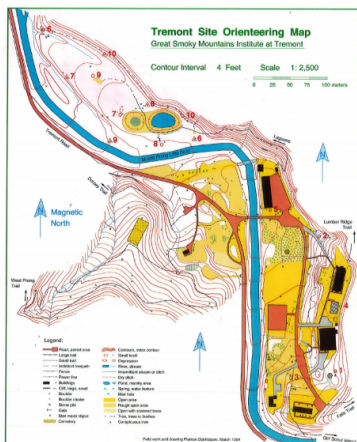
1. Line up the edge of the base plate with the route. Place the compass on the map with the edge of the base plate touching both the starting location and the destination. The direction of travel arrow (fred) should be pointing the direction of the destination.
2. Set the dial with the direction of the route. Hold the base plate against the map and turn the dial so that the orienting arrow (shed) is oriented with north on the map. Once it's all lined up, the bearing is set. The degree number that lines up with the direction of travel arrow (fred) is the bearing for that route.
3. Follow the bearing. Pick the compass off of the map and hold it flat with the direction of travel arrow (fred) facing away from you. Turn your whole body so that the magnetic arrow is in the orienting arrow, at that point, the direction of travel arrow is pointing towards the destination. An easier way to remember this is to "put RED in the SHED and follow FRED"

### PACING

You may need to use pacing to determine distance. On flat ground, 1 pace (2 steps) is about equal to 5 feet. This changes based on the terrain and the height/stride length of the individual.

- ▶ *Practice using pacing to determine distance. One strategy is to count by 5's each time you step with your right foot.*

## MATERIAL BREAKDOWN



### TREMONT SITE ORIENTEERING MAP

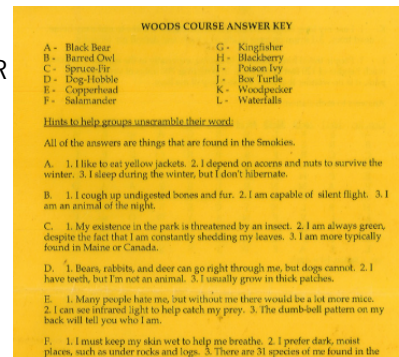
Necessary for...

- Campus Course
- West Prong/Cemetery Woods Course

### WOODS COURSE ANSWER KEY

Necessary for...

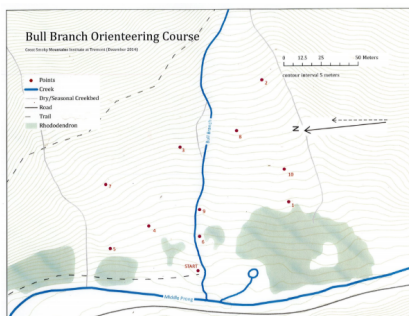
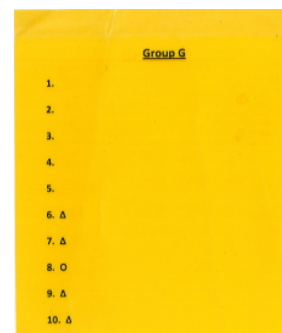
- West Prong Woods Course
- Bull Branch Woods Course



### WOODS COURSE GROUP SHEET

Necessary for...

- West Prong Woods Course
- Bull Branch Woods Course



### BULL BRANCH ORIENTEERING COURSE

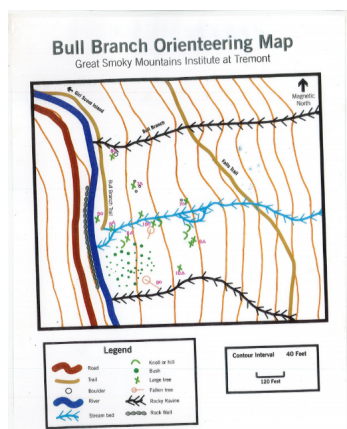
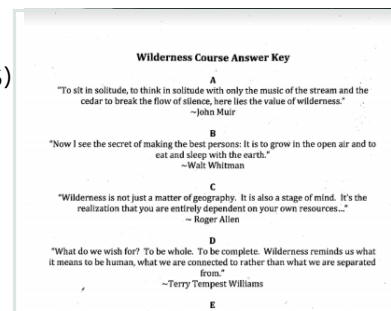
Necessary for...

- Bull Branch Advanced Course

### ADVANCED (WILDERNESS) COURSE ANSWER KEY

Necessary for...

- Bull Branch Advanced Course



### BULL BRANCH ORIENTEERING MAP

Necessary for...

- Bull Branch Woods Course

### ADVANCED COURSE GROUP SHEET

Necessary for...

- Bull Branch Advanced Course

