

WHICH WAY IS NORTH?

Students explore the workings and the practical uses of a compass. Using some of the basic skills of orienteering, including bearing, direction, and pacing, students create and participate in a scavenger hunt.

TEACHER NOTES FOR DISCUSSION

Boy Scout groups, your local Department of Natural Resources, individual parents/students may be able to provide you with compasses and/or actual orienteering instruction. If your class is not familiar with orienteering, contact your local education agency. They should have a film or video on orienteering.

You can conduct these activities outside or inside depending on the weather. The number of students per group will depend on the number of available compasses.

Exercise 1: Compass Bearing

Begin by discussing the basic function of a compass and then move on to the activity. Closely observe students to make sure everyone understands bearing.

Exercise 2: Determine Bearing from North

This activity requires that prior to class, you set up a course of about ten consecutive places. Use the classroom door or the door of the school as the first point. The next location should be within line of sight. The third location should be within line of sight of the second and so on. In this way, students use the previous spot as a point of reference. For example, the water fountain is 280 degrees west of the classroom door and the outgoing door is 45 degrees northeast from the water fountain.

Another option is to have some of the points within line of sight, with other objects out of the line of site. In other words, students would have to go around objects such as trees, or playground equipment and then get back on course to find the next specified point. The reference points you choose will depend on your school, but could include the water fountain, principle's desk, flagpole, etc. The more specific the better.

Exercise 3: Pacing

This activity provides students with the awareness that a compass and the pace of their feet can be used as a unit of measure to locate a destination.

Prior to the activity, either you, a custodian, or parent volunteers need to measure 100 yards along your football field marking each five-yard point with a paint stripe, a cone, or some other marker.

As a warm-up activity, have students estimate how many steps it will take to cover a 120-foot distance. Then, have each student walk what they believe is 120 feet. After everyone has come to a stop, indicate the actual location of 120 feet. Correct gross errors.

Objectives

By the end of this activity, students should be able to:

- determine the correct compass bearing of ten points.
- accurately measure individual pace.
- construct an orienteering course.
- use orienteering skills to complete a course.

Time Considerations

Instructor preparation:
two hours

Student activity:
three classes

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Assessment Notes

This performance assessment allows students to use all the skills they have acquired. Working with a group or a partner, students will construct a scavenger hunt course for another group of students to follow. You may want to stipulate off limit areas or prescribe a certain number of outdoor or indoor locations.

Instruct students to give you their first clue card with the name of their group. You will be in charge of redistributing the cards to another group. You may choose to conduct this activity whereby the first group back to classroom wins.

RELATED STANDARDS AND BENCHMARKS

Geography

Standard 1. Understands the characteristics and uses of maps, globes and other

- geographic tools and technologies

Standard 3. Understands the characteristics and uses of spatial organization of the earth's surface

Mathematics

Standard 4. Understands and applies basic and advanced properties of the concepts of measurement

- solves problems involving units of measurement and converts answers to a larger or smaller unit within the same system (i.e., standard or metric)
- understands the concepts of precision and significant digits as they relate to measurement (e.g., how units indicate precision)
- selects and uses appropriate units and tools, depending on degree of accuracy required, to find measurements for real-world problems mission

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UNDERSTAND YOUR MISSION

In this activity you will use a compass to find your own way in a natural setting as well as construct a compass course to challenge your peers' orienteering knowledge.

LEARN THE LINGO

bearing	determination of position in degrees
compass	a device for determining direction by means of a magnetic needle or group of needles turning freely on a pivot and pointing to magnetic north.
lanyard	string or rope that attaches to a compass at one end the compass user on the other
cardinal directions	north, south, east, west
orienteering	a cross-country race in which in which each participant uses a compass and a map to navigate between checkpoints on an unfamiliar course
pacing	to measure distance by walking evenly and slowly.
scavenger hunt	a game in which players are given hints to help acquire a list of objects or navigate through a course

Gather Your Supplies

- clipboards
(one per team)
- marking paint,
or marking devices
such as cones
- index cards (5 x 8)
- Silva compass or any
other compass with
lanyard to waist level
- tape measure

BACKGROUND

Directions and location are very important as you study the Mississippi River. Knowing how to use a compass is useful if you decide to camp or hike around the headwater region at the Lake Itasca National Park or anywhere else along the river.

Remember, a compass does not really point north—not true north (except by coincidence in some areas). Magnetic force attracts the compass needle, which varies in different parts of the world and is constantly changing. When you read north on a compass, you are really reading the direction of the magnetic north pole.

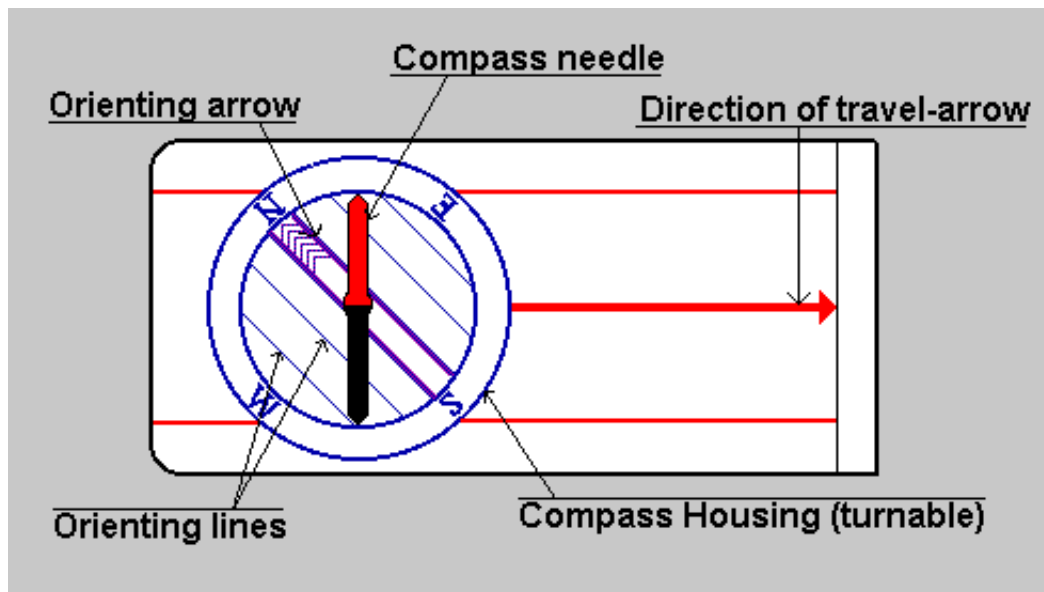
Also, remember that iron and steel affect compass readings. Be sure to stay away from pocketknives, belt buckles, railroad tracks, trucks, electrical lines, and so forth when you are using a compass in the field.

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CHART A COURSE FOR EXPLORATION

Exercise 1: Compass Bearing

Bearing is the direction in which any point lies from a point of reference. Bearing is measured in degrees from one of the quarters (north, south, east, west) of a compass.



Go Beyond

Take a field trip to a local state park and complete a rigorous orienteering course set up by the state rangers.

Compass Information

To find north, orient your compass:

1. set the dial to 360 degrees
2. match the needle to the imprinted arrow inside the base of the compass
3. you are now facing magnetic north

For correct directions, the magnetic needle and the red arrow on the compass' movable ring must always be the same. At magnetic north, you should be facing the direction that has the compass ring close to 360 degrees matched with the magnetic arrow.

Position the compass at approximately stomach level (arms at 90-degree bend) close to the body. All movements must be with the body, not the arms. (This will assure you are pointing in the proper direction.)

Point your compass to north (360 degrees or zero). You will know you are correct if you see red arrow (magnetic needle) in the compass pointing north.

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Exercise 1: Compass Bearing

Using your compass, insert the correct bearing for the following directions

DIRECTION	BEARING
NORTH	
SOUTH	
EAST	
WEST	
NORTHWEST	
NORTHEAST	
SOUTHWEST	
SOUTHEAST	
NORTH-NORTHWEST	
NORTH-NORTHEAST	
SOUTH-SOUTHWEST	
SOUTH-SOUTHEAST	
EAST-SOUTHEAST	
EAST-NORTHEAST	
WEST-NORTHWEST	
WEST-SOUTH WEST	

Exercise 2: Determine Bearing from North

Your teacher has set up a course of ten points around your school. Work with a partner or small groups to locate these points. For each place, identify location and bearing.

LOCATION	BEARING
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

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Exercise 3: Pacing

Your feet and a compass can be used as a unit of measure to locate a destination. To do this you will have to figure out what your average pace is. Work with a partner.

1. Walk the length of the football field (100 yards) twice. Have your partner count and record the number of steps. Note: keep your head up and walk normally.
2. Average the steps or pace for 100 yards by dividing 100 yards by the average pace.

Now that you know how many feet make up one of your paces, how long would it take you to travel one mile?

Exercise 3: Pacing Information

NAME	
AT 100 YARDS	
TEST 1 - NUMBER OF PACES	
TEST 2 - NUMBER OF PACES	
AVERAGE NUMBER OF PACES FOR 100 YARDS	
NOW DIVIDE: 100 YARDS/AVERAGE PACE	
(THE ANSWER IS THE LENGTH OF YOUR PACE IN FEET)	

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SCAVENGER HUNT

Now you are ready to put compass bearing and pacing together. For the assessment activity, you will work with a group to create a scavenger hunt course. After you have created a course, you will give your first of many clues to one of the other groups and see if they can get through your course.

1. Create a scavenger hunt

With your partner or small group, choose eight locations either inside the school building or directly outdoors.

2. Locate distance and bearing

Measure the distance (using pacing) and direction (bearing from your compass) from the classroom to the first destination and then from the first destination to then next and so on.

3. Make up clues

At each point you will want to leave a clue. Use index cards to create fun and challenging clue cards that will send the scavenger party from one point to the next. Give your teacher the first card and place the rest of the clues at the appropriate locations.

4. Let the Games Begin

Your teacher will give you your first clue card. Armed with your wit, orienteering skills, and a compass, you and your party are ready to find your way through a challenging course.

EXAMPLE:

Your first clue might be “from the classroom door, go the number of feet times two of our grade. Now take that times ten and head that bearing from north.” This would mean that if the scavenger party were seventh graders they would go 14 feet at 140 degrees or toward the southeast. At that location they would find another clue sending them to a different destination until they finally made it back to the classroom where they would find the last card that would congratulate them on a job well done!

REFERENCES

McNeill, Carol, Tom Renfrew, and Jean Cory-Wright. *Teaching Orienteering: British Orienteering*. Human Kinetics. November 1997.

Kjellstrom, Bjorn and Newt Heisley. *Be an Expert with Map and Compass: The Complete Orienteering Handbook*. Macmillan General Reference. July 1994.

Boy Scouts of America. *Orienteering*. Boy Scouts of America. June 1994.