

TEACHING AIDS

USPS District 3

SQUADRON: OYSTER BAY

COURSE: PILOTING

● PURPOSE OF AID:

For Piloting Class:

To demonstrate the relationship between Relative Bearing, Magnetic Heading and Magnetic Bearing.

$$MB = MH + RB$$

Magnetic Bearing = Magnetic Heading + Relative Bearing

To demonstrate, *assuming there is no deviation*, the Compass on the boat stays pointing to Magnetic North no matter which direction the boat is facing.



● MATERIALS NEEDED:

Base board: 1 pc. 13 ½" x 13 ½" plywood board,

Boat: 1 pc. 11" x 7 ½" plywood,

Compass: 2 pcs. 4" diameter round plywood disks,

Computer printout compass rose.

1" diameter round wooden nob

Bearing guide: 1 pc. 11" x 1 ½" clear plastic strip

Small boat: 1 pc. 2" x 1" plywood

Spacers: plywood disk and paper disks

Misc.: 1 pc. 1 ½" long ½" dowel, screw and nut, red, white, green and blue paints, and glue.

● METHOD OF CONSTRUCTION:

1. Base board: drill $\frac{1}{2}$ " hole in the center of $13 \frac{1}{2}$ " x $13 \frac{1}{2}$ " plywood board, paint in blue.
2. Boat: trim 11 " x $7 \frac{1}{2}$ " plywood into boat shape, drill $\frac{1}{2}$ " hole in center, paint in 3 colors: red, green and white.
3. Compass: glue the computer printout compass rose onto the 4 " diameter round wooden disk, drill $\frac{1}{2}$ " hole in center.
4. Drill $\frac{1}{2}$ " hole in the center of the 1 " diameter round wooden nob, paint in white.
5. Carve a straight line on the 11 " x $1 \frac{1}{2}$ " clear plastic strip, drill $\frac{1}{2}$ " hole at one end;
6. Shape the 2 " x 1 " plywood into boat shape, paint part in red and part in green, screw it onto the other end of the clear plastic strip.
7. Glue dowel to the center of base board.
8. Assemble disk, boat, paper disks, plastic strip, and compass onto dowel through the $\frac{1}{2}$ " holes.
9. Glue the wooden nob on top of the dowel and the compass.

● OPERATION OF AID:

The black lines on the boat represent Relative Bearings.

The compass rose in the center of the boat represents the boat compass.

The plastic arm can be moved to indicate relative bearings.

For example: Boating heading is 30° M, relative bearing is 90° , find magnetic bearing.



1. Turn the boat to the 30° heading according to the compass.

2. Adjust the plastic arm over the relative bearing mark (black lines) at 90° .

3. Read magnetic bearing directly where the line on arm crosses the compass. 120° will be indicated on the compass which is the magnetic bearing of the object. What this is showing that the magnetic bearing is equal to the magnetic heading plus the relative bearing.

$$\mathbf{MB = MH + RB}$$

● ILLUSTRATION:

To show the running light features:

2 sidelights: green on starboard and red on port, each from dead ahead to 22.5° abaft the beam. Stern light: white light showing aft 135° arc from 22.5° abaft the beam on either side. In the illustration above, the little boat is moving away from the big boat.

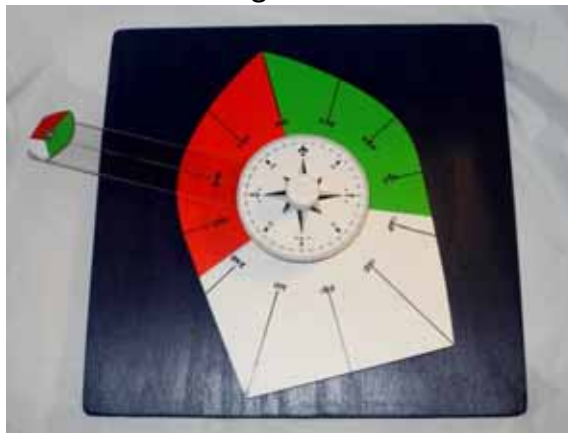
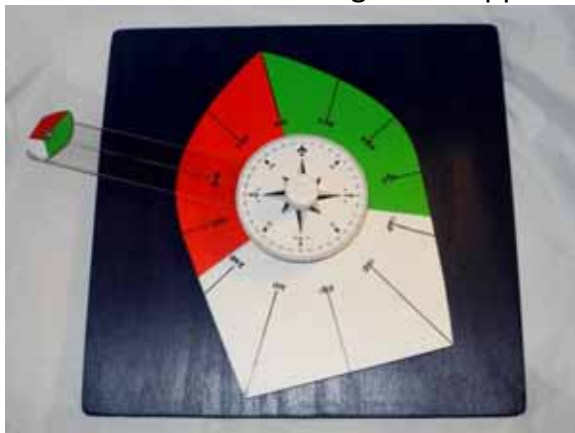
To demonstrate the “Rules of Road” by looking at the navigation lights on the approaching boat:

If you are on the big boat and see the red light on the approaching boat you are the “give way boat” as he can see your green light, he is the “stand on boat”.



The device indicates whether an approaching boat will collide with you or pass ahead or astern of you:

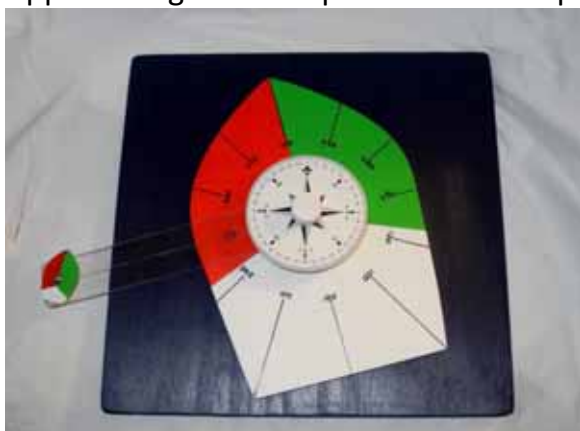
Collision course if bearing to the approaching boat does not change.



Approaching boat will pass ahead if on starboard side the RB decreases over time.



Approaching boat will pass ahead if on port side the RB increases over time.



Head on meeting boats, turn to starboard to avoid collision.



Boat will pass astern if on starboard side RB increases.



Boat will pass astern if on port side RB decreases.



No collision if boats are on parallel courses.

Courses on smaller boat at end of arm either parallel or approaching can be set by rotating it on the arm.