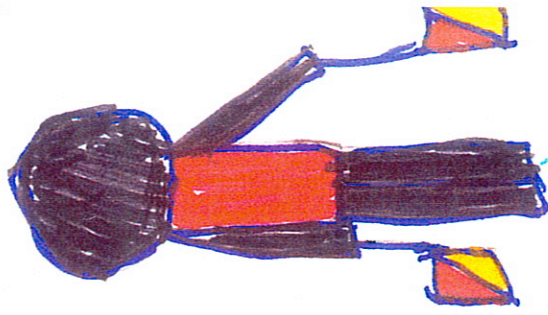
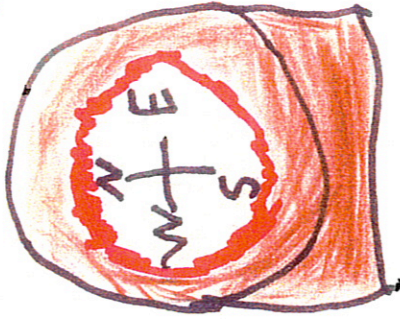
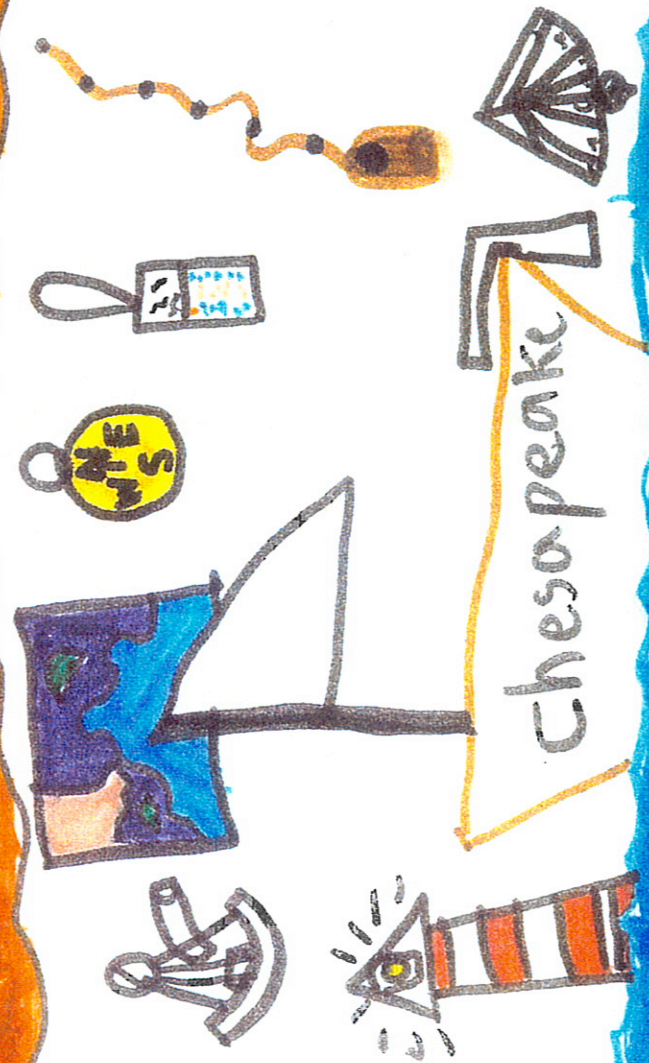


# Tools for Sailors

# Aloha, Mate!



# Navigation Tools used by sailors

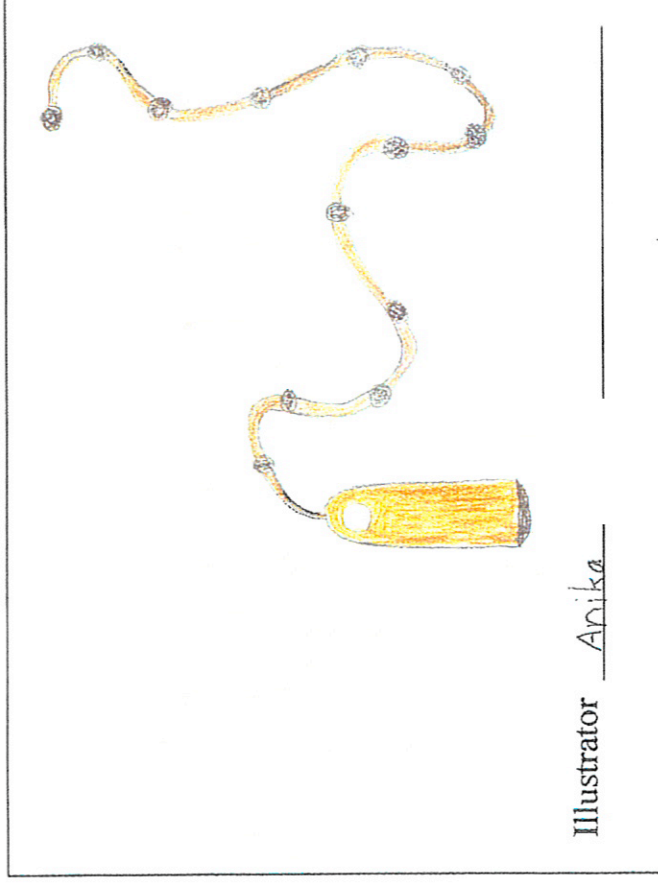


# Celestial Navigation



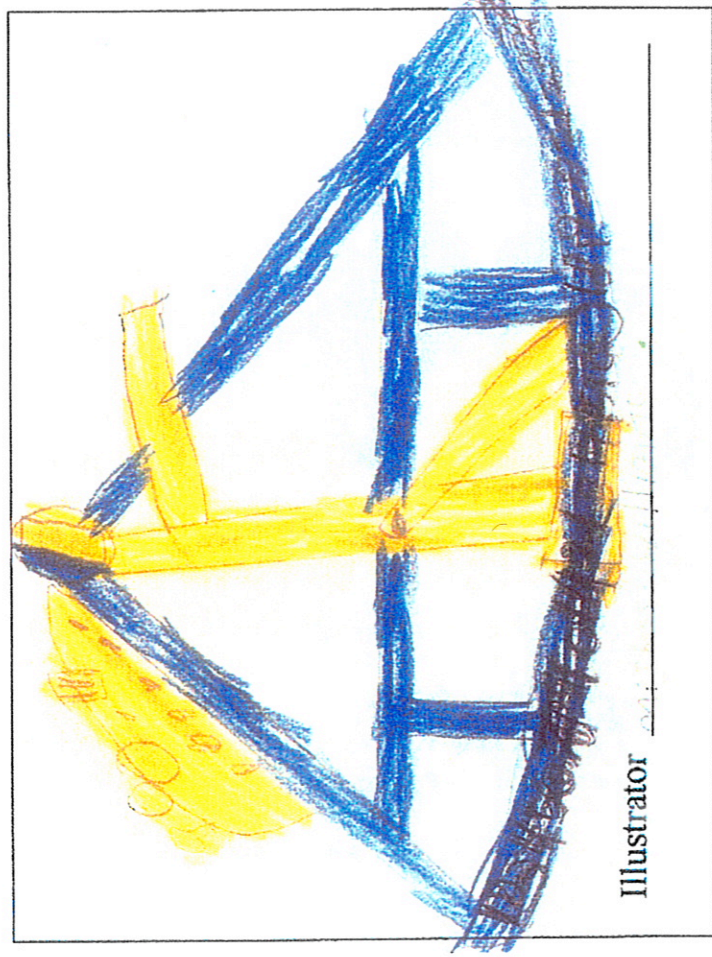
All year the Big Dipper points to the North Star. The North Star is also called Polaris. The North Star (Polaris) helps sailors find north if they get lost. They can't use the North Star if it is cloudy.

# Sounding Line



A sounding line is used to measure how deep the water is. The sounding line has wax at the bottom of it. The sounding line brings samples up from the bottom of the sea. It will tell you if bottom of the sea is made out of rocks or made out of sand. It had knots that were equal distances apart. You count the knots to tell you how deep the water is.

# Sextant



A sextant is used to measure the angle between the sun and the horizon. It is used to figure out latitude. The first sextant to work well was made in the 1700's. It is still a basic tool of navigation, used at sea and on land.

# Quadrant



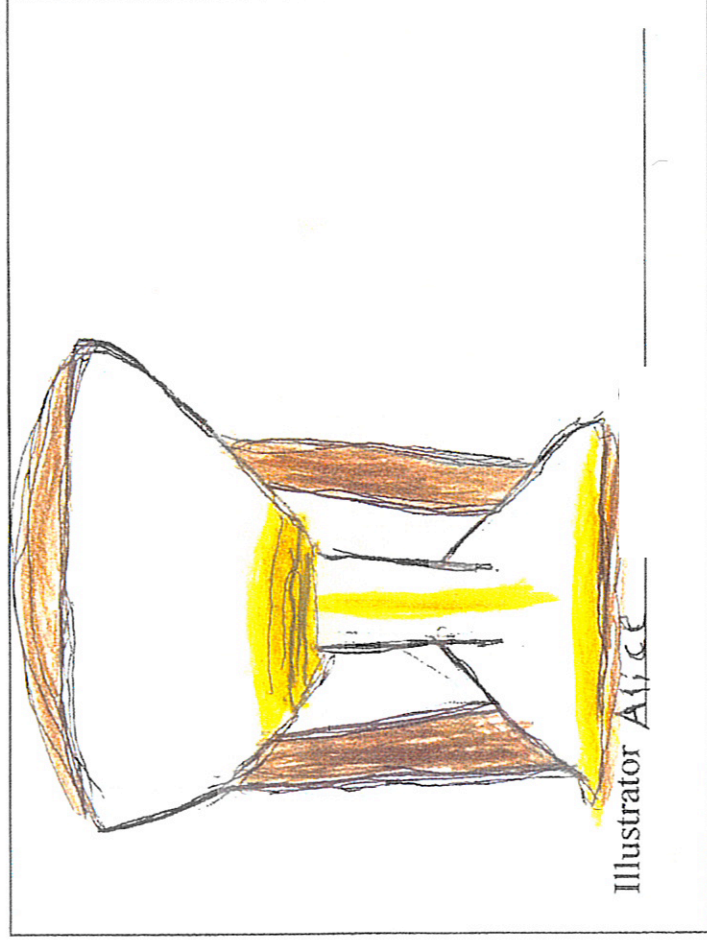
The quadrant is used to figure out latitude. The curved edge is divided from 0 to 90 degrees. The plumb line falls to the degree markings to tell you the latitude.

# Astrolabe



An astrolabe is an instrument used to tell you what latitude you are at.

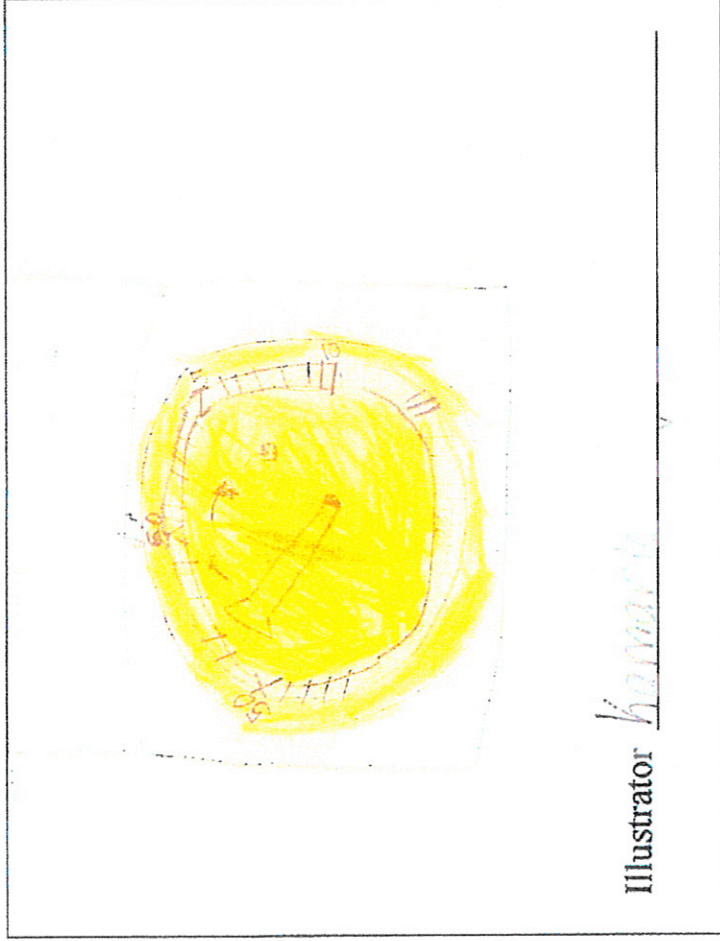
# Sand Glass



A sand glass is a tool for measuring the passage of time aboard a ship. The sand from the top part passes down to the bottom part through the neck. You have to turn it over to start the time again.



# Chronometer



Illustrator

*Kamari*

A marine chronometer is like a big watch for a ship. There are lots of different kinds but most of them are kept in boxes. Knowing the time can help a sailor know where they are at sea.

# Magnetic Compass



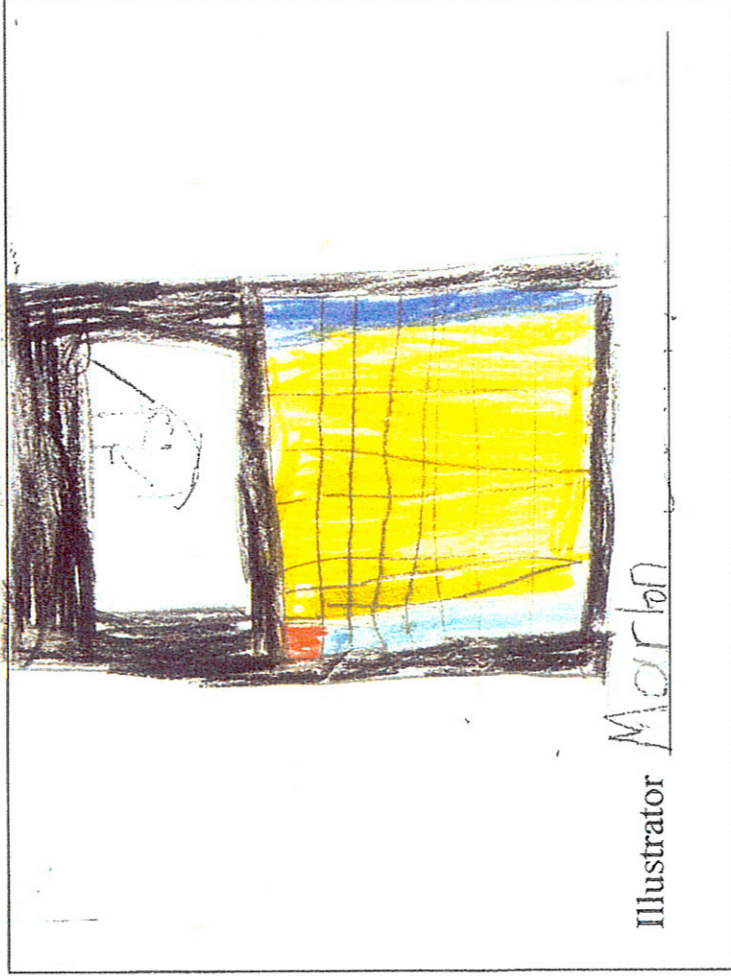
A compass is used to tell you where north is. The first compass was made in China in the 11th Century. If you know where North is you can tell where you are.

# Navigation Chart



A navigation chart is a map used at sea. A navigation chart has landmarks on it showing where land is and showing channels, rocks, hazard buoys and sand bars. A sailor needs a navigation chart to figure out where they are at sea.

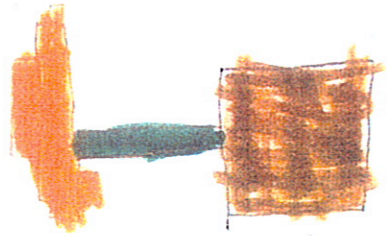
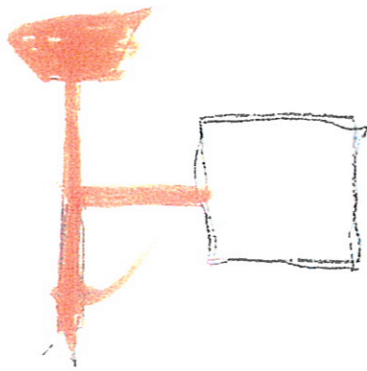
# G.P.S. (Global Positioning System)



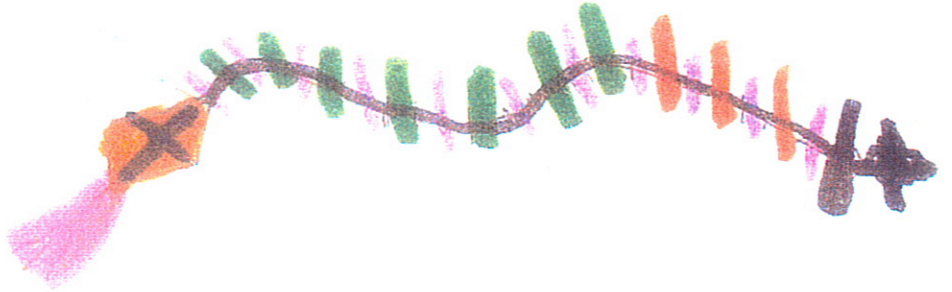
The g.p.s. can tell you where you are. It works from satellites in space. The g.p.s. can be used on land or sea or air. The g.p.s. is important because you can know where you are within 104 feet.

# Tools

W  
M  
S



Prowbeel



# Kites

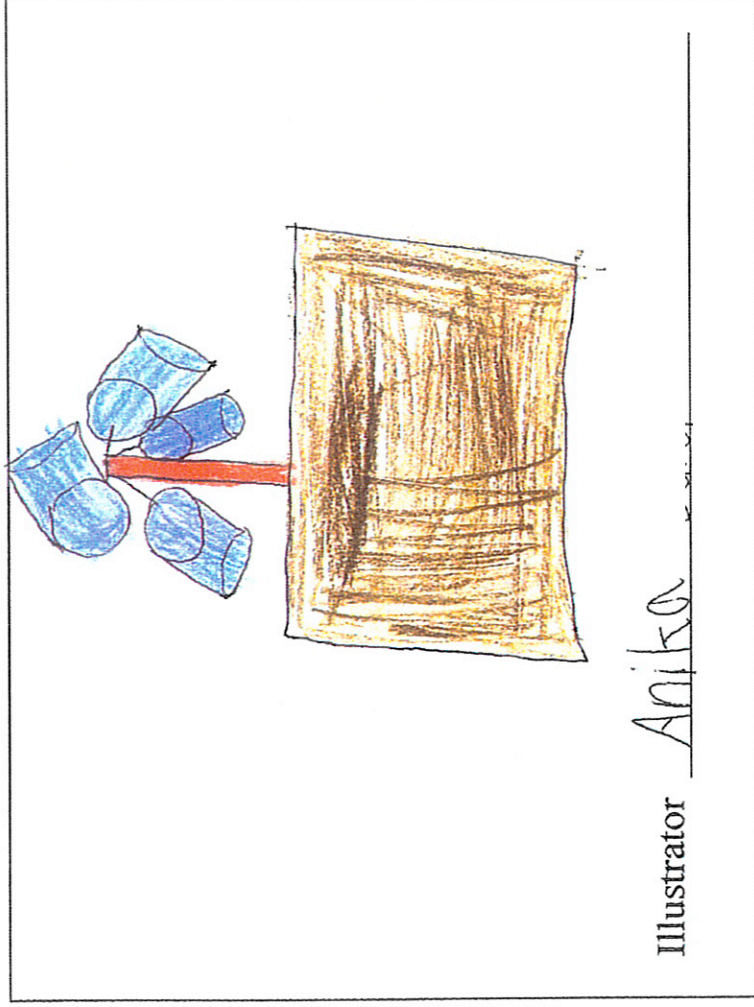


Illustrator

Alice

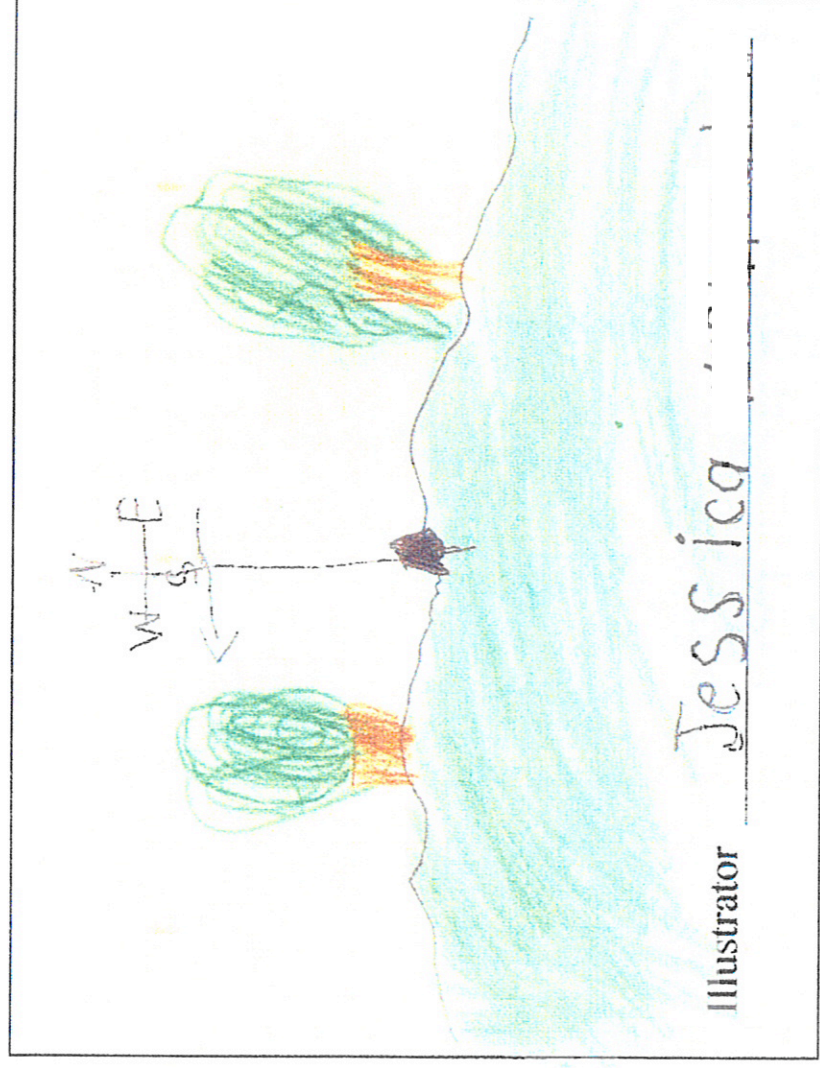
Kites tell you which direction the wind is going. It can tell you how strong the wind is.

# Anemometer



An anemometer tells you how fast the wind is. The anemometer tells you if it is a calm wind, a gentle breeze, a moderate breeze, or a strong breeze. You have to count how many times it goes around.

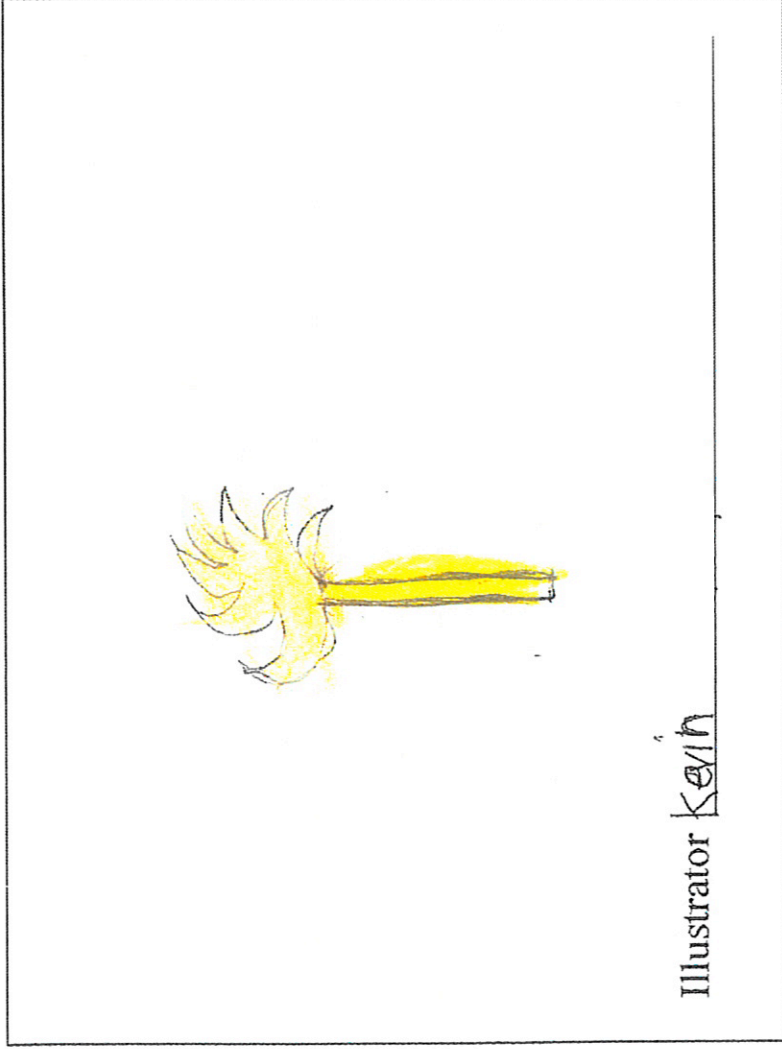
# Weather Vane



The weather vane is a tool that shows which way the wind is going. It can come from the South, North, West, or East.



# Pinwheel

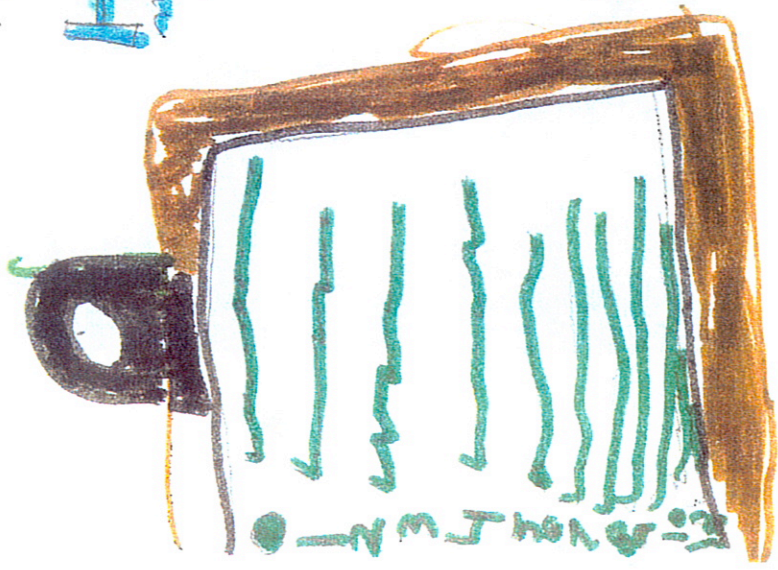


This is a pinwheel. It tells you how strong the wind is. It only spins when the wind hits it in the center.

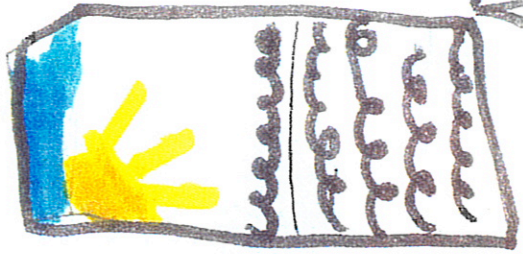
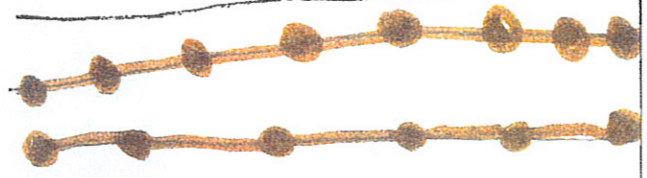
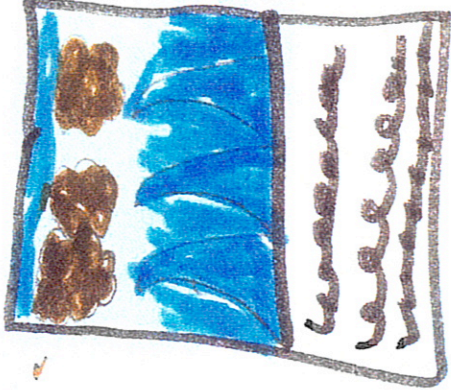
# The Beaufort Scale

and

Knobs



Force 12



0

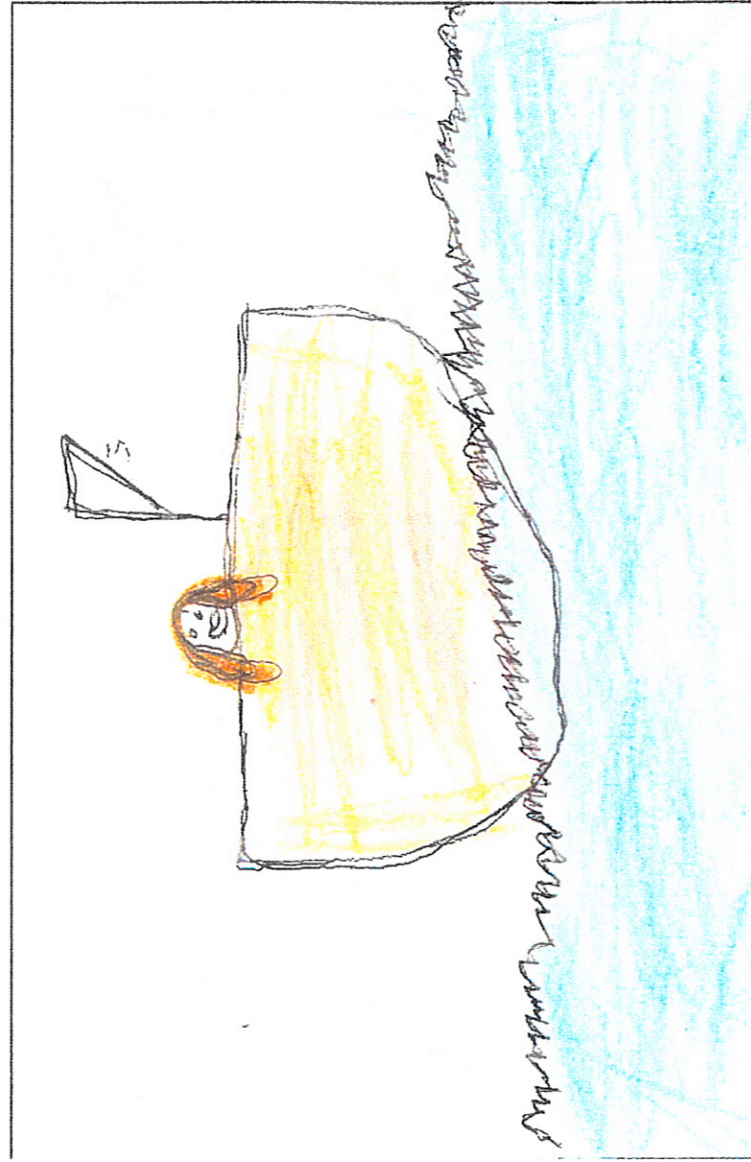
Force

# Force 0 Less Than 1 Knot



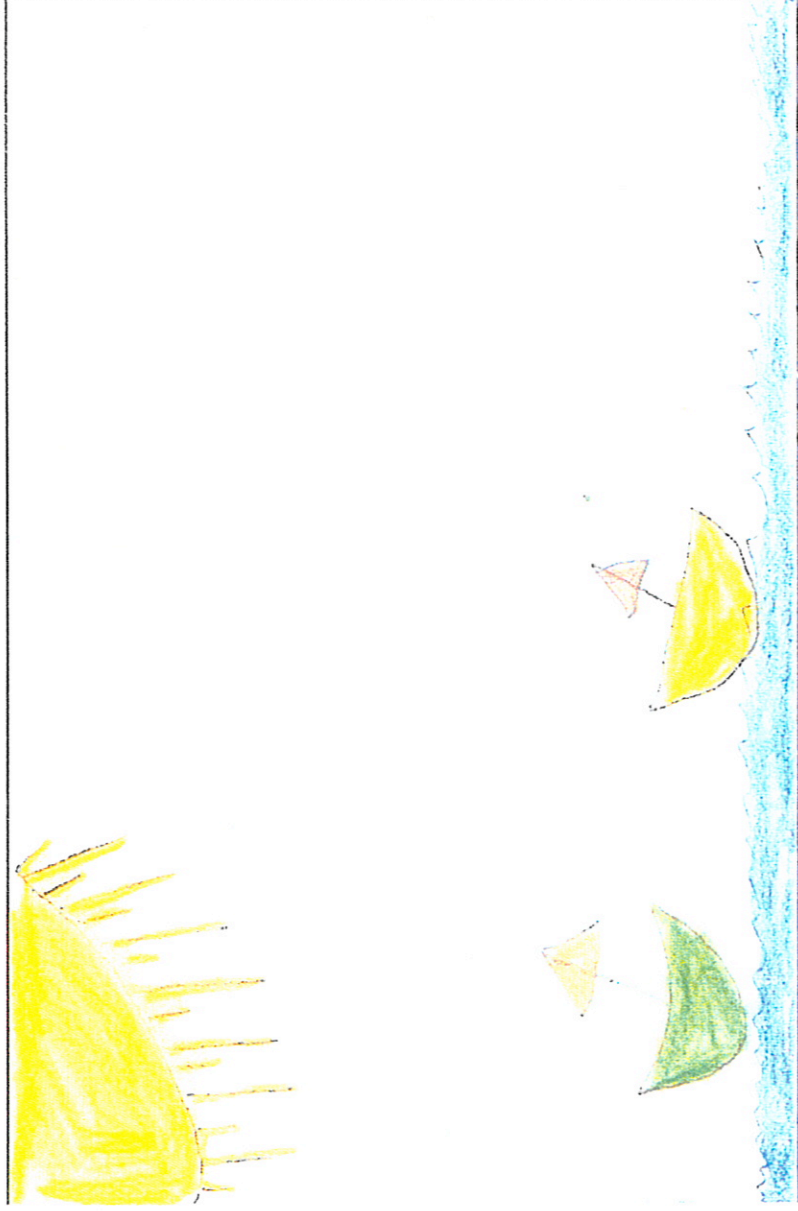
Force 0 has no wind. There are no waves in the sea.  
The sea is like a mirror.

# Force 1 1 to 3 Knots



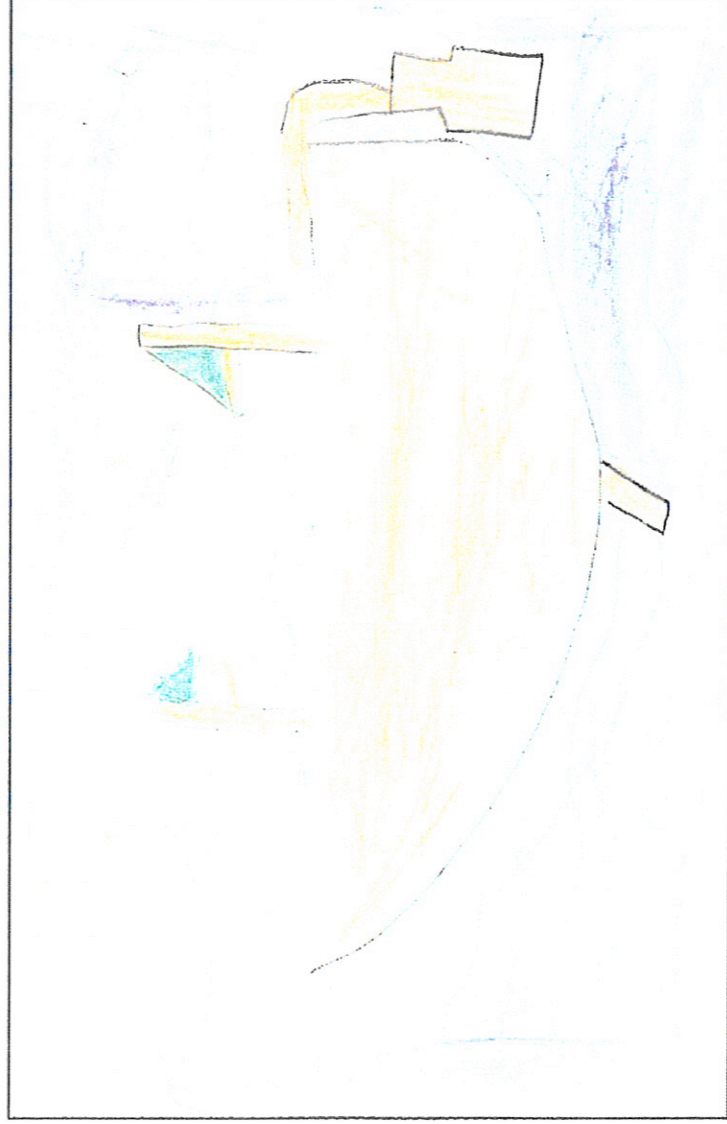
The wind is very light. The waves are just little ripples.

## Force 2 4 to 6 Knots



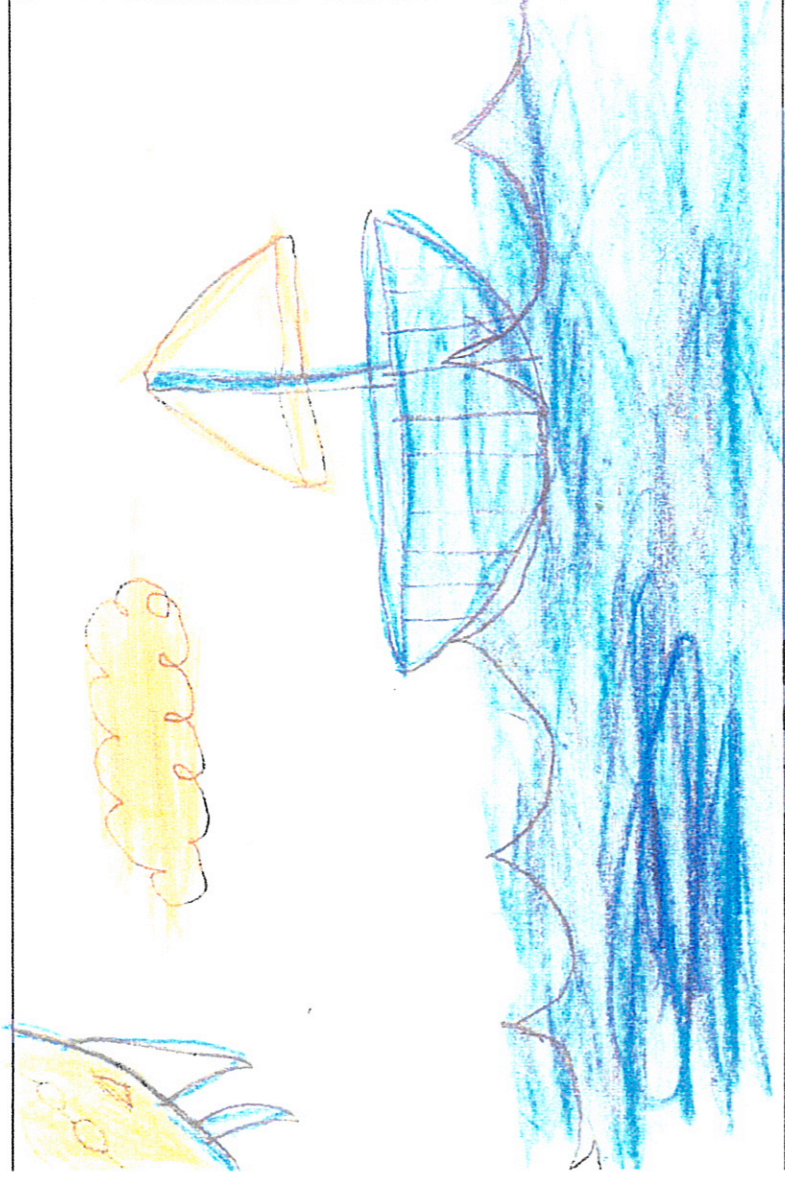
There is a light breeze and very small waves. You can still see your reflection in the water.

## Force 3 7 to 10 Knots



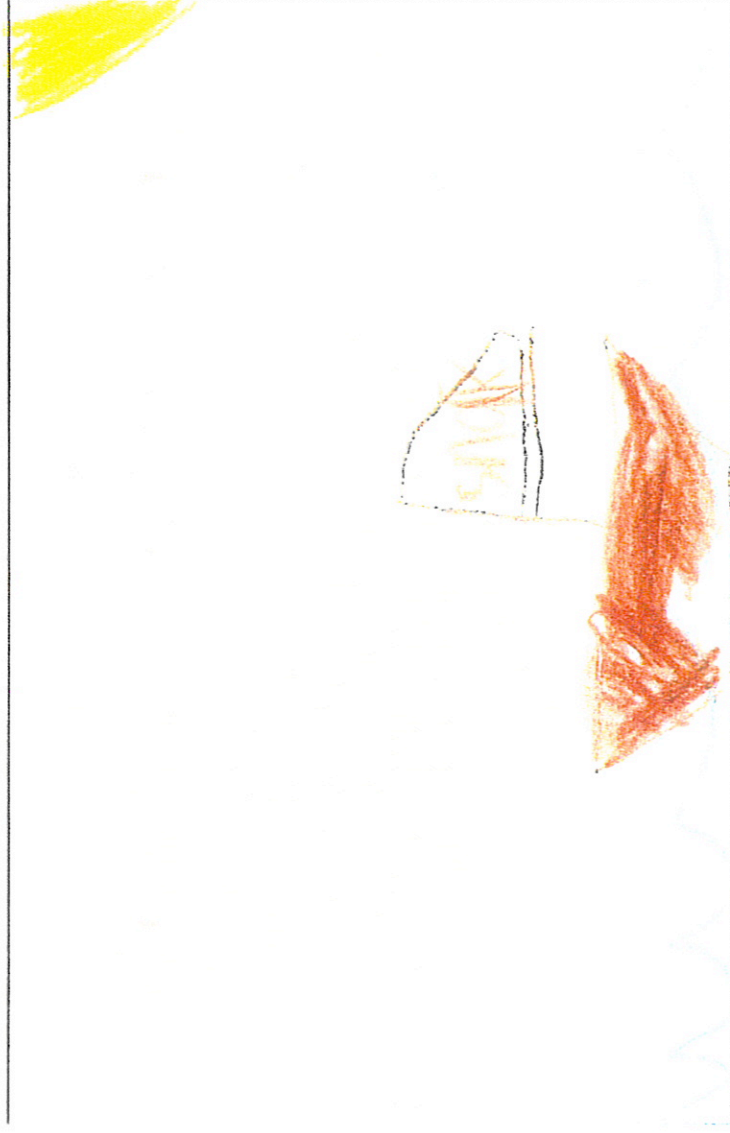
It will be a gentle breeze. There will be some foam.  
The waves will be small.

## Force 4 11 to 16 Knots



There is a moderate breeze. The waves become longer. Some waves have whitecaps.

## Force 5 17 to 21 Knots



Force five is a moderate breeze. It has some white foam and some water spraying. The waves are pretty high.

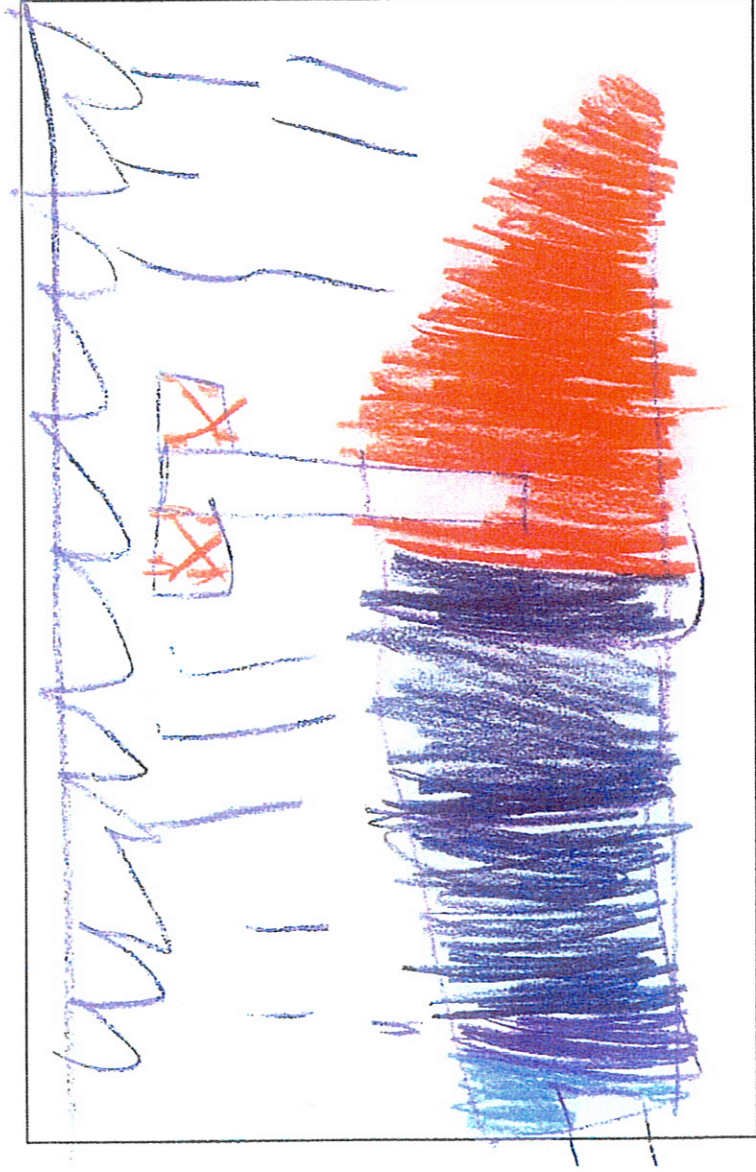


## Force 6 22 to 27 Knots



It is a strong breeze. There are white caps and spray.  
There are large waves.

## Force 7 28 to 33 Knots



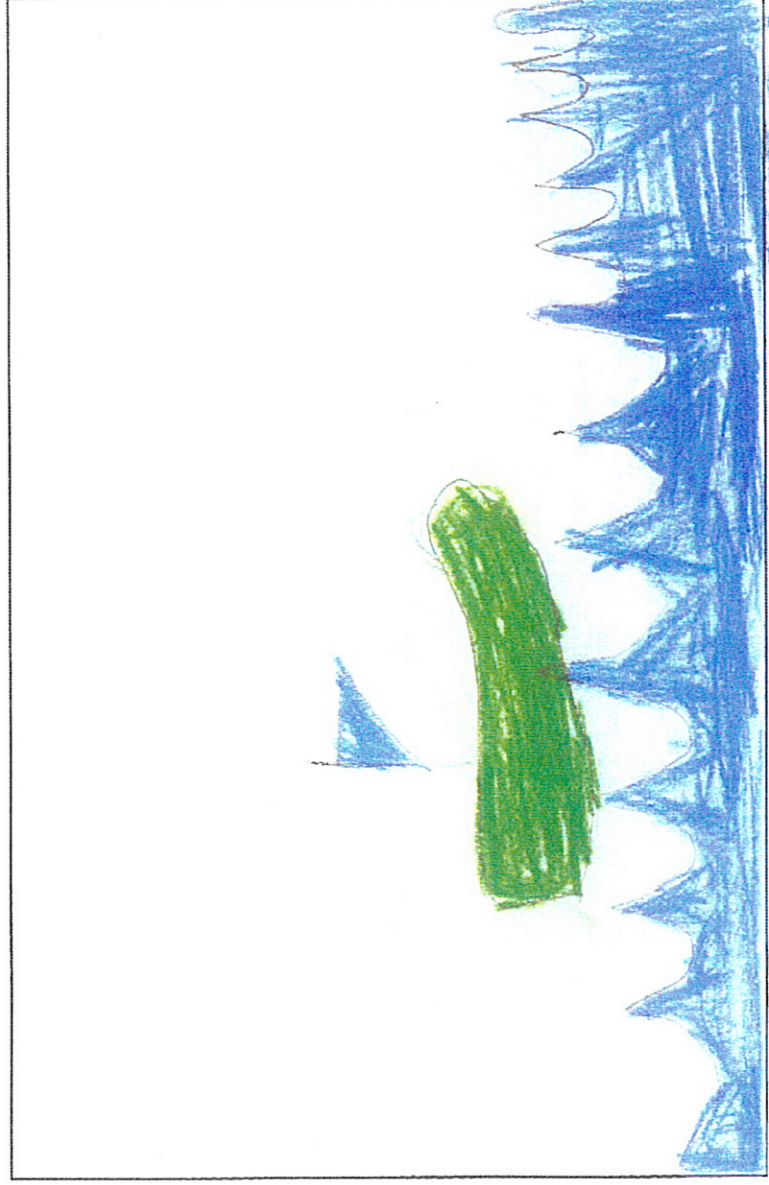
Force 7 means some white caps and white foam.  
There are breaking waves.

**Force 8  
34 to 40 Knots**



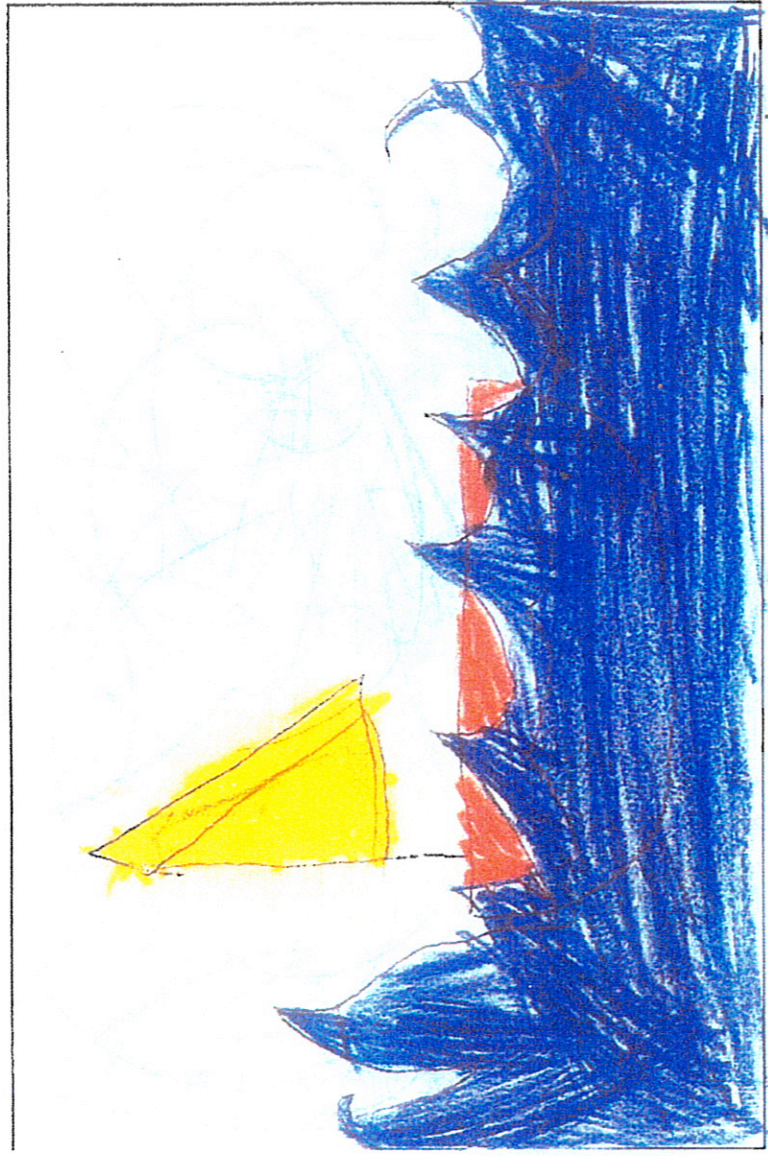
There will be a strong wind. The waves will be high.

## Force 9 41 to 47 Knots



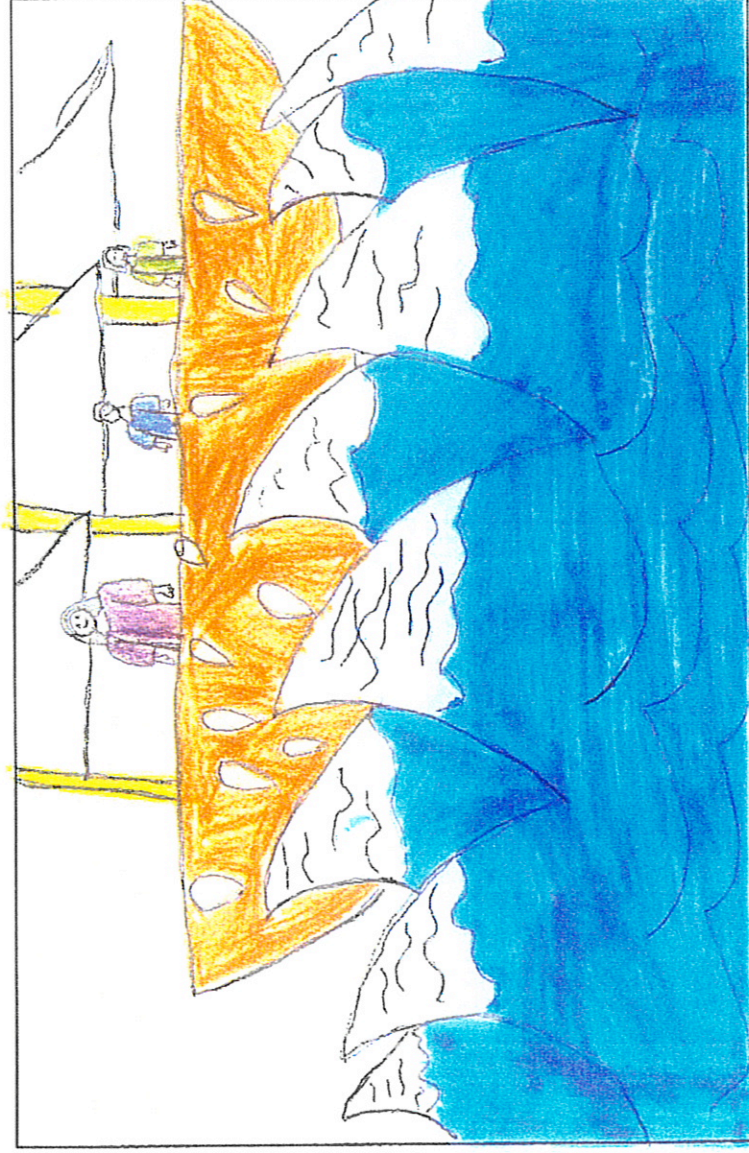
The wind is strong. The waves are high with thick foam. The sea begins to roll. The spray makes it hard

**Force 10  
48 to 55 Knots**



The wind is very strong. The waves are very high with large crests.

## Force 11 56 to 63 Knots

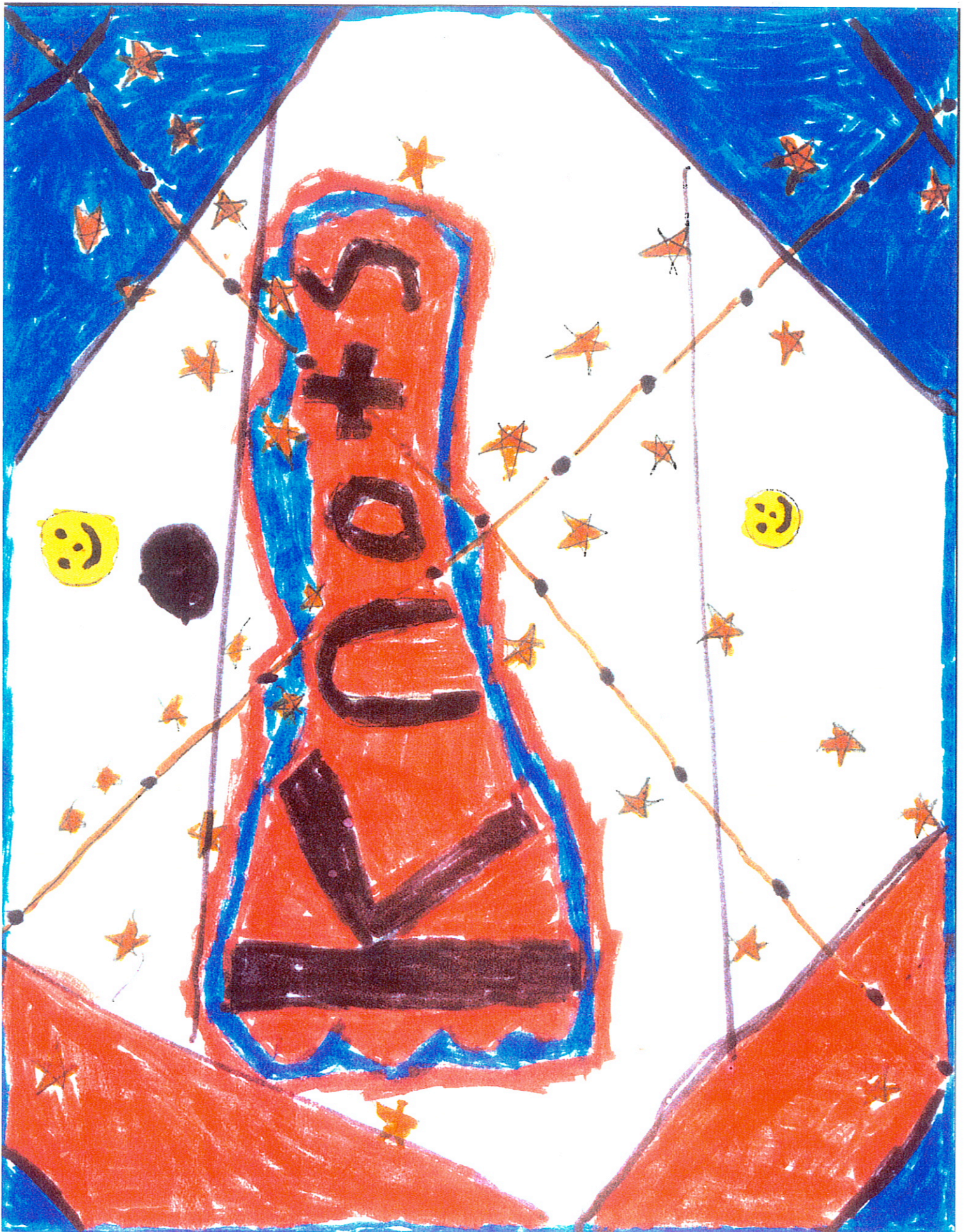


The wind is very strong. The waves are very high. The whole air is filled with foam.

## Force 12 64 to 71 Knots



The wind is very very strong. Force 12 means a hurricane. The sea is filled with foam and spray.







Knots are tied rope. Long time ago, sailors used knots to measure how deep the sea was. They made many knots on a rope and dropped it in the water so they could see how deep the water was.

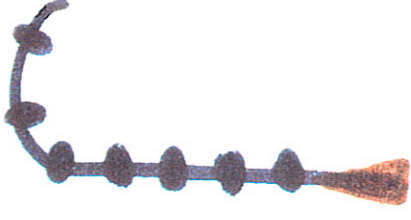


Now, sailors use knots to tie things together.

It is important for sailors to know who to tie knots?

Yes. It is important because you have many things that you have to tie on your boat. You have to tie:

Your boat to the dock  
the anchor to your boat  
the sails together  
the flags to the flagpole



It might be windy or rainy. A storm might come. So if  
you now knots, you can survive on the sea!

What makes a good knot?

Knots have to be:

Easy to tie  
Easy to untie  
Strong!

Sailors' Language

Sailors call rope "line".  
Anything to tie things on your boat is a line.



# Kinds of Knots

These are some kinds of knots.

Bends

Square knot

Loops

Bowline

Stopper knots

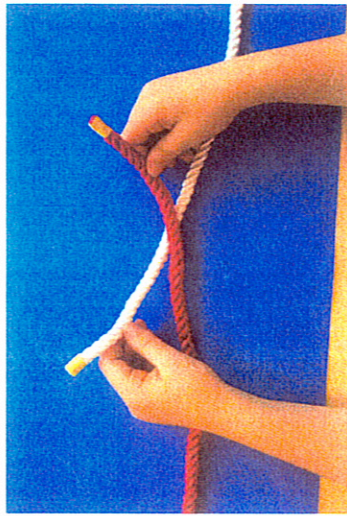
Figure 8

Hitches

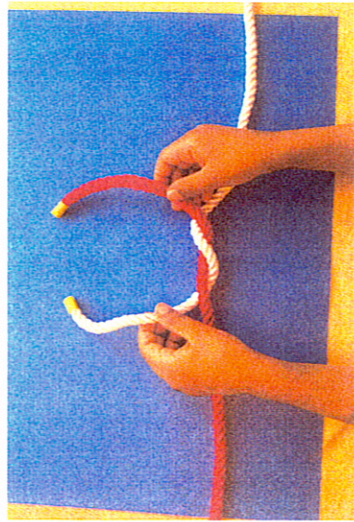
Round Turn with Two Half Hitches



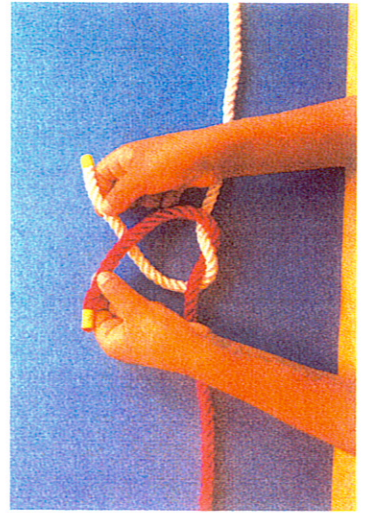
# Square Knot



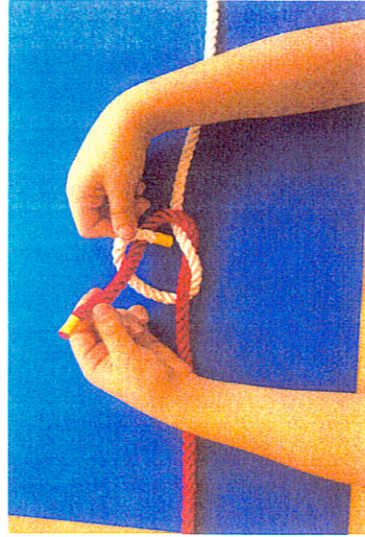
1



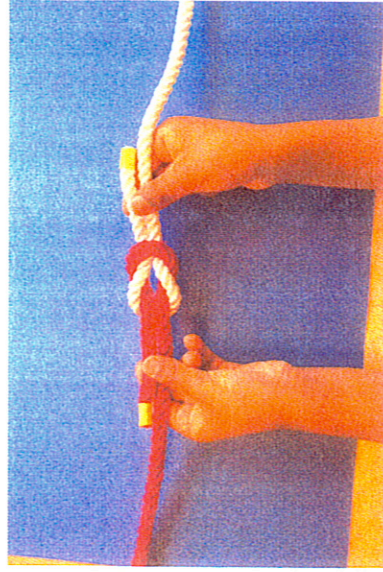
2



3

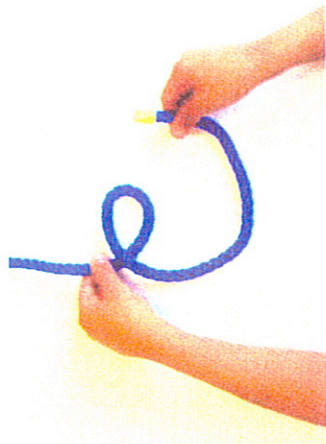


4

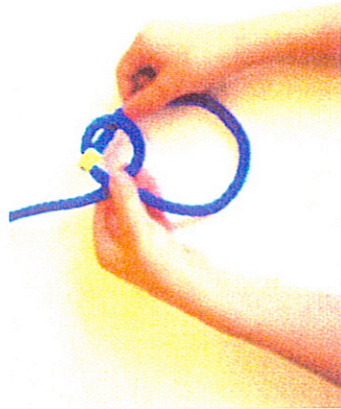


5

# Bowline



1



2



3



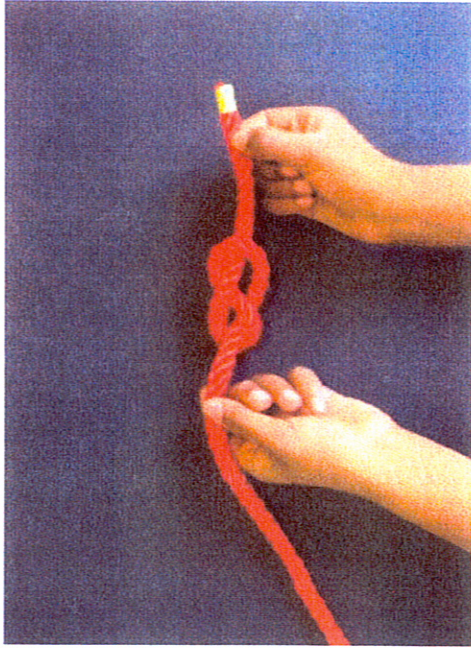
4



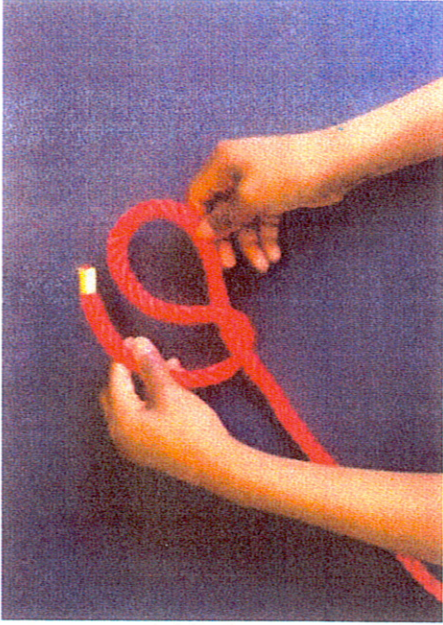
5

# Figure 8

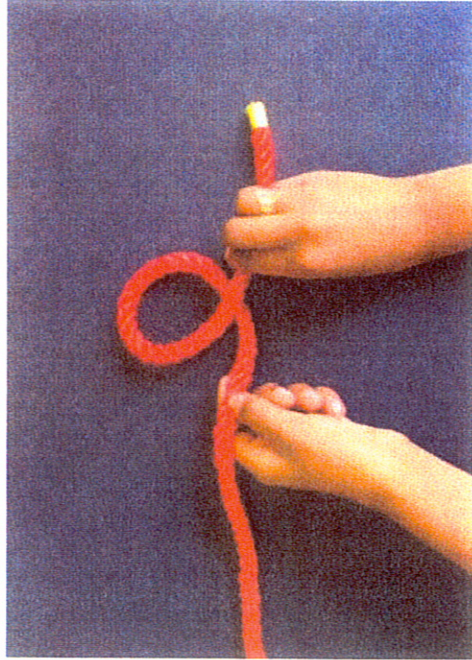
1



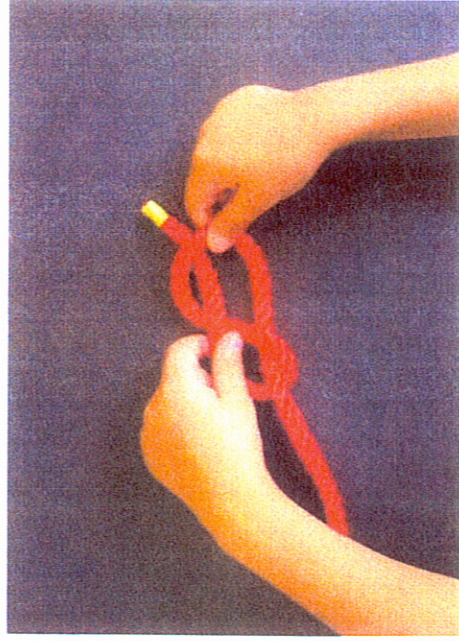
4



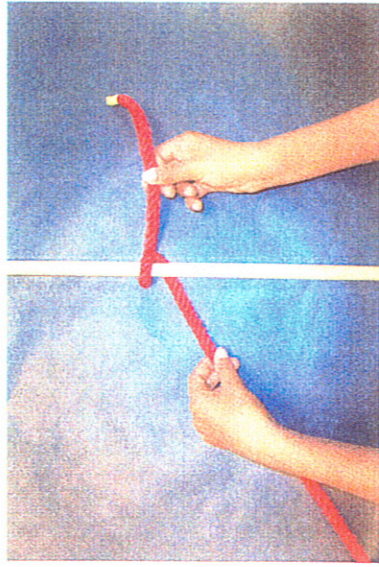
2



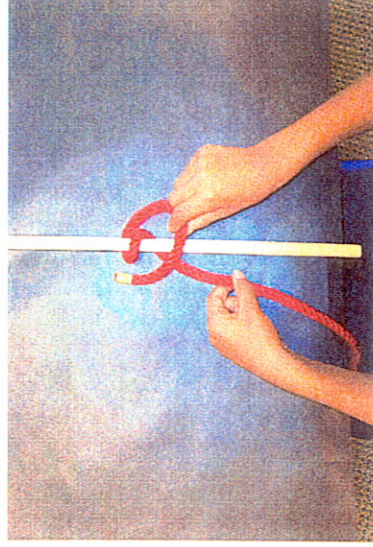
5



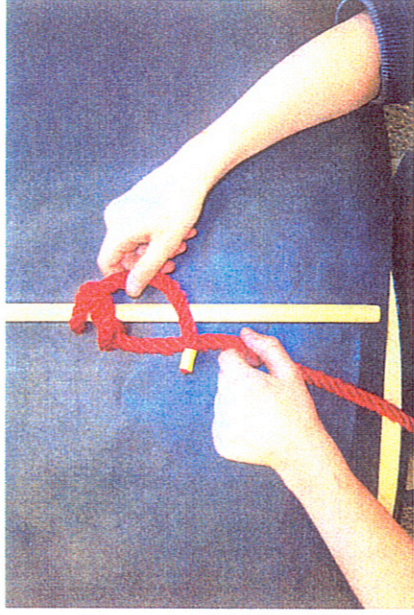
# Round Turn with Two Half Hitches



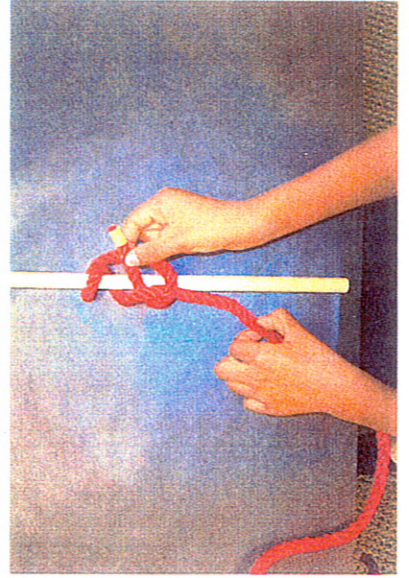
1



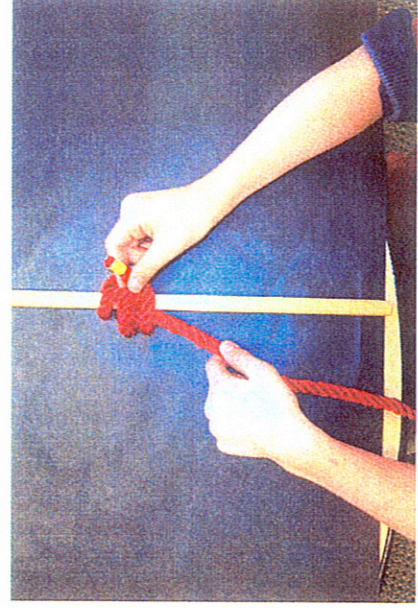
2



4



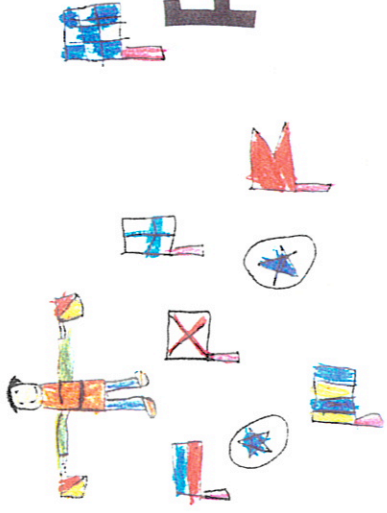
3



5







# Flag Signals

One of the tools for sailors is flag signals. Flag signals are <sup>used</sup> to communicate with other ships. You can send messages from one ship to another by waving flags or hoisting flags on a flagpole.

Is it important for sailors to know flag signals?

Yes. It's important because flag signals help you:

When you need help  
when the power goes out and you can't use other  
communication tools  
when you want to send messages, but you don't  
speak the same language

So, it is very useful to know flag  
signals because you'll never  
know what's going to happen  
on the sea. And also, it's cool!

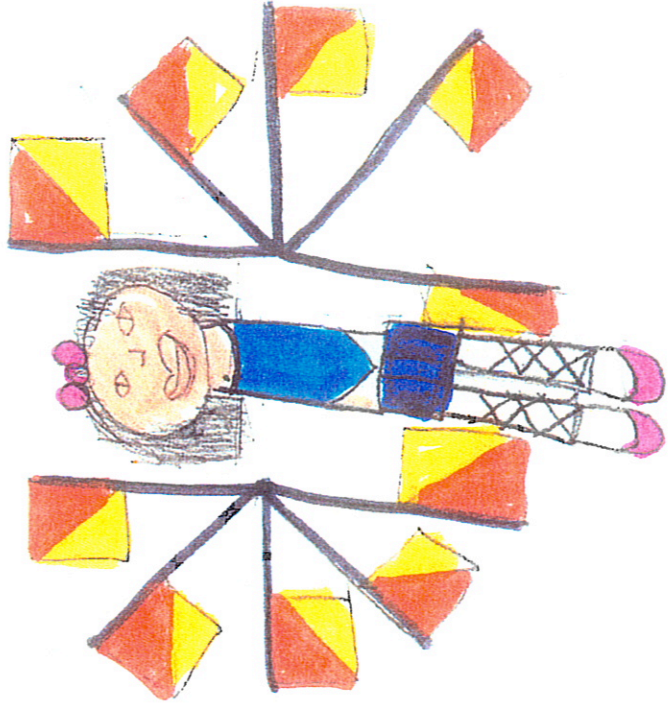


# Semaphore Flag Signaling System

Semaphore flag signaling system is a way to communicate with flags. You use your arms to wave the flags. You can spell words by following the patterns. There are different positions for each letter.

## Positions

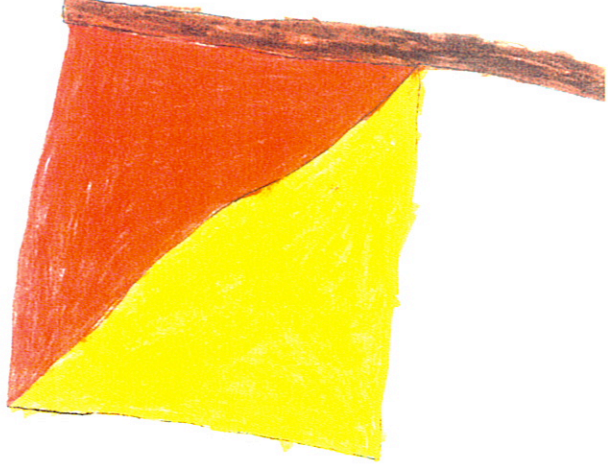
The Semaphore flag positions are:  
up, down, high, low, and out.

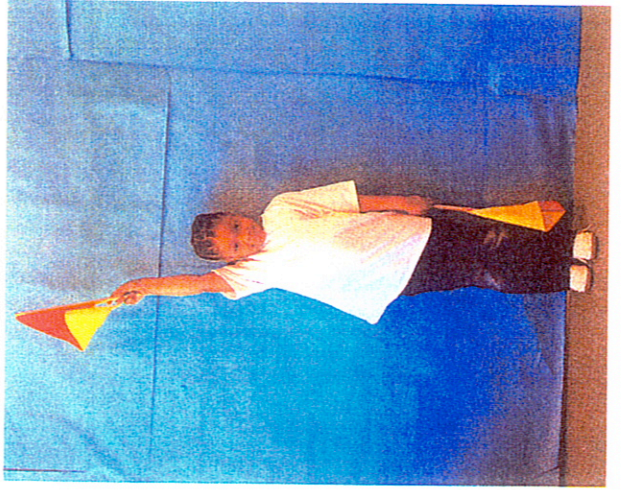


# Flags

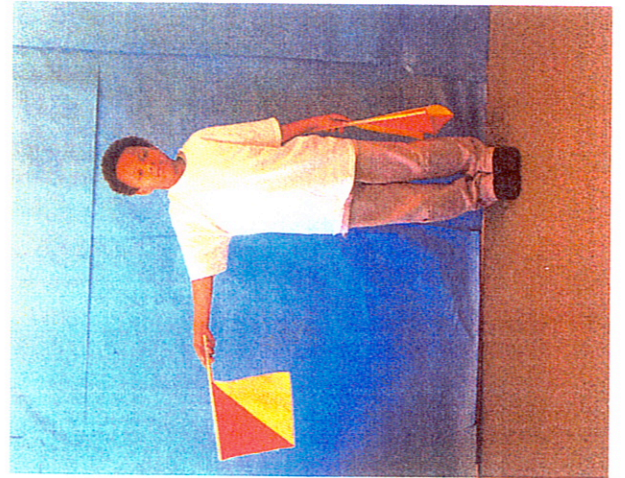
You use a pair of flags to wave. You have one flag on each hand and follow the patterns to sign each letter in the alphabet.

Semaphore flags are square. A square is spread into two triangles by a diagonal line. One triangle is red and the other triangle is yellow.



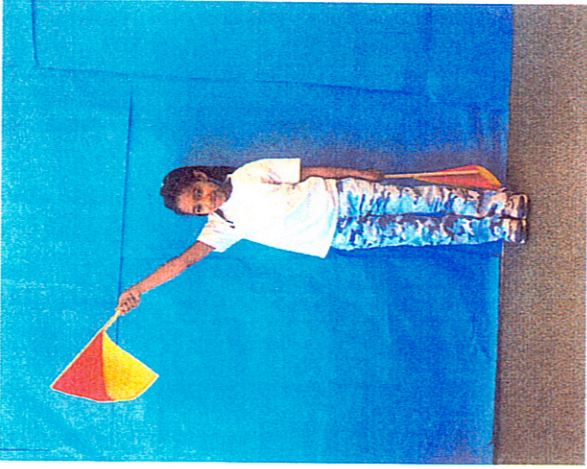


D

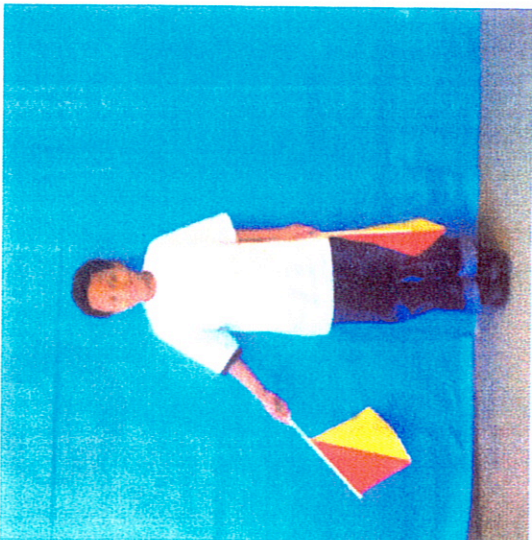


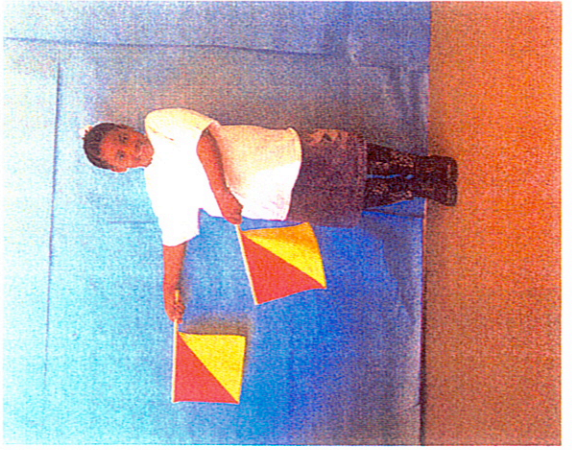
B

C

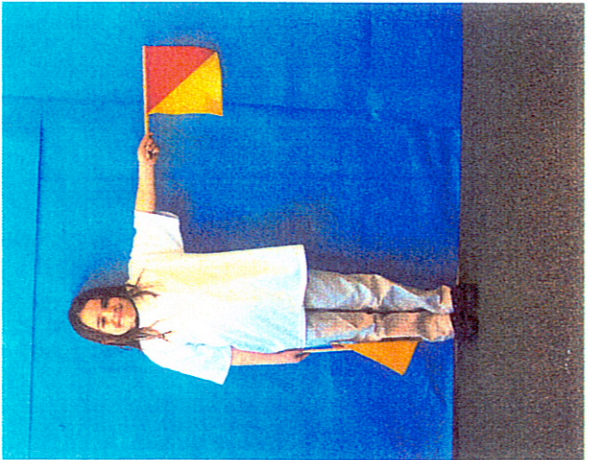


A





H

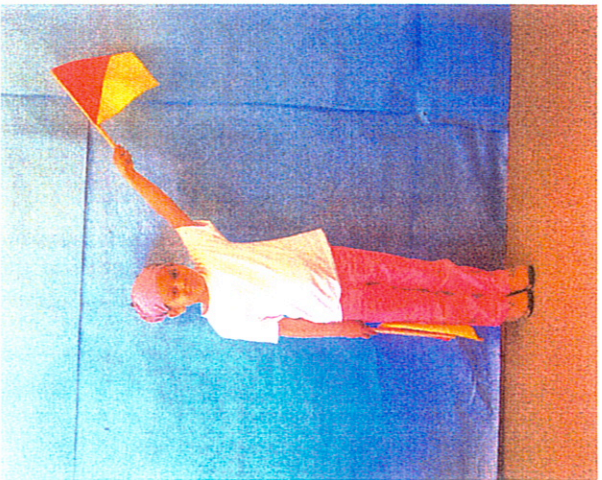


F

G



E





L

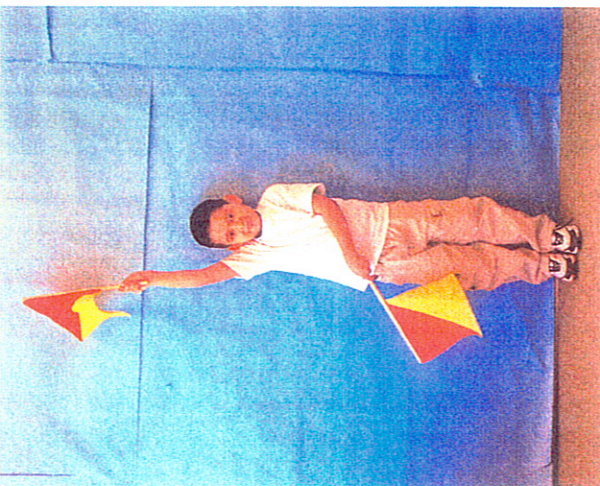


J

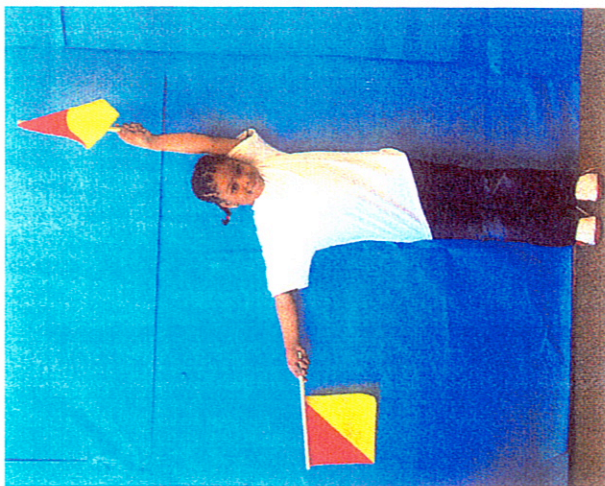
K



I





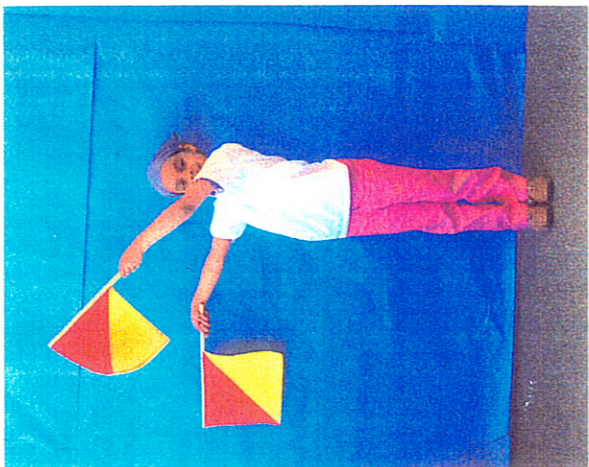


P

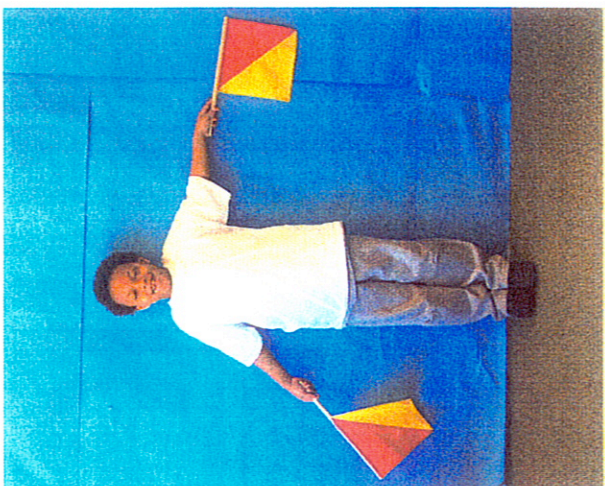


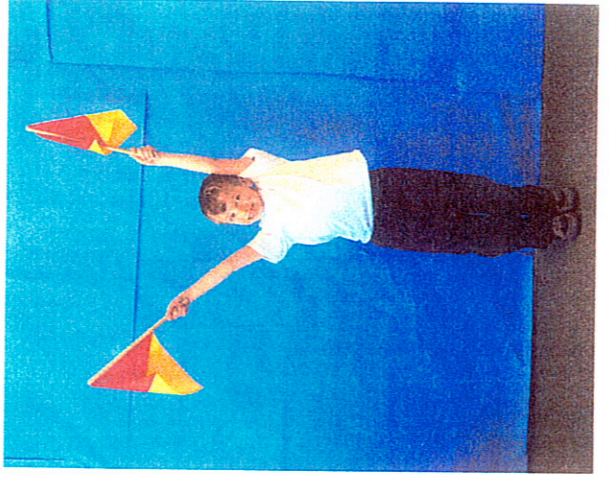
N

O

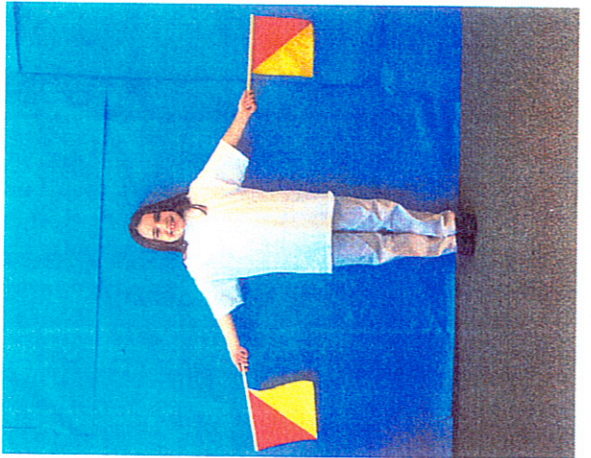


M



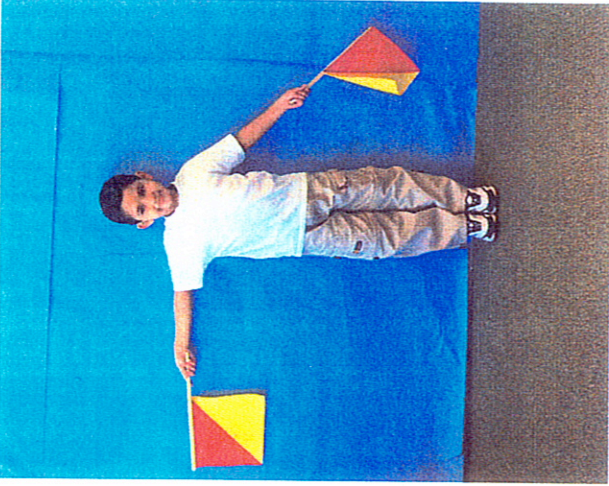


T



R

S



Q



W



X



V

U



# International Code of Signals

International Code of Signals is a neat way to communicate with other ships. It is very fast and easy to do.

Instead of trying to spell words, for example when you need a doctor...

With International Flag Signaling System, you have to spell:

I N-E-E-D A D-O-C-T-O-R.

But with International Code of Signals, you just have to put one flag on the flagpole.

Because this flag has a message for "Immediate medical assistance".


# Flags

The flags for International Flag Signaling System and International Code of Signals have their own colors and designs. The colors used are white, yellow, red, blue, and black.

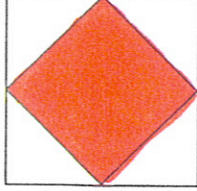
The shapes are squares, fishtail shapes, <sup>and</sup> long triangles with tips are cutoff.



	Letter <b>A</b>
Name Alfa	
Message Diver down, keep clear	

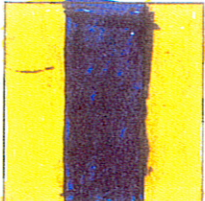
	Letter <b>E</b>
Name Echo	
Message I am changing course to starboard	

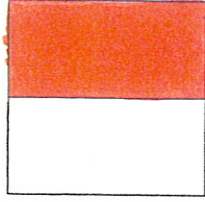
	Letter <b>B</b>
Name Bravo	
Message Man overboard	

	Letter <b>F</b>
Name Foxtrot	
Message Disabled	

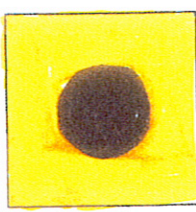
	Letter <b>C</b>
Name Charlie	
Message Yes	

	Letter <b>G</b>
Name Golf	
Message Pilot needed	

	Letter <b>D</b>
Name Delta	
Message Keep clear	

	Letter <b>H</b>
Name Hotel	
Message Pilot on board	


Letter **I**



Name **I**

Message **I am changing course to port**

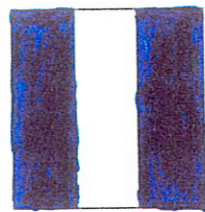
Letter **M**



Name **Mike**

Message **Stopped**

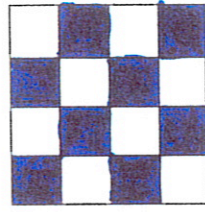
Letter **J**



Name **Juliett**

Message **Keep clear of fire and have buoy rope ready**

Letter **N**



Name **November**

Message **No**

Letter **K**



Name **Kilo**

Message **Desu to communicate**

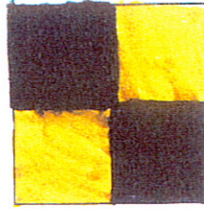
Letter **O**



Name **Os**

Message **Man Overboard**

Letter **L**



Name **Lima**

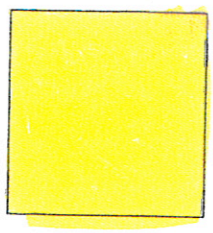
Message **Stop immediately**

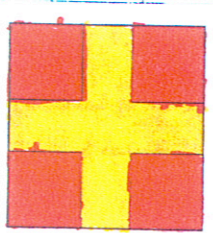
Letter **P**

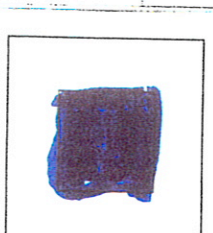



Name **Papa**

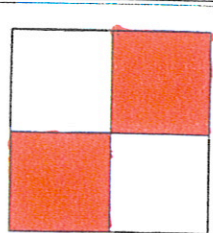
Message **About to sail**

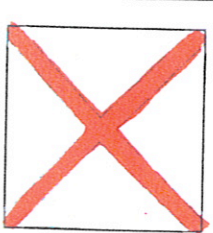
<p>Letter <b>Q</b></p> <p>Name <b>Quebec</b></p> <p>Message <b>My vessel is "healthy"</b></p>	
---	---

<p>Letter <b>R</b></p> <p>Name <b>Romeo</b></p> <p>Message <b>no fire arm</b></p>	
---	---

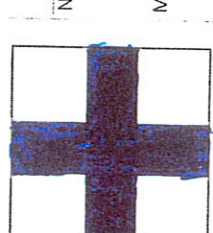
<p>Letter <b>S</b></p> <p>Name <b>Sierra</b></p> <p>Message <b>Flaming backward</b></p>	
---	--

<p>Letter <b>T</b></p> <p>Name <b>tango</b></p> <p>Message <b>keep clear</b></p>	
--	---

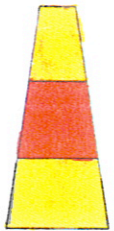
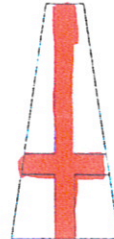
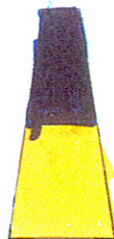
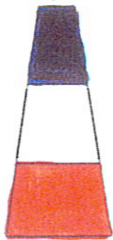
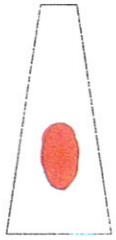
<p>Letter <b>U</b></p> <p>Name <b>Uniform</b></p> <p>Message <b>You are moving into danger</b></p>	
--	---

<p>Letter <b>V</b></p> <p>Name <b>Victor</b></p> <p>Message <b>Require assistance</b></p>	
---	---

<p>Letter <b>W</b></p> <p>Name <b>Whiskey</b></p> <p>Message <b>Require Medical Assistance</b></p>	
--	--

<p>Letter <b>X</b></p> <p>Name <b>X-ray</b></p> <p>Message <b>stay your distance</b></p>	
--	---





1

2

3

4

5

6


7

8

9

0

<p>Letter</p> <p><b>Y</b></p>	<p>Name</p> <p>Yalike</p> <p>Message</p> <p>Am dragging anchor</p>
	

<p>Letter</p> <p><b>Z</b></p>	<p>Name</p> <p>Zulu</p> <p>Message</p> <p>Require a tug</p>
	

Mrs. Sue Bell  
3719 Brandywine NW  
Washington, DC 20016

Ahoy Mate



**Capital City Public Charter School**  
**Second Grade 2002-2003**

E 128  
Tools For Sailors: Ahoy Mate  
R. Berger Archive  
Capital City