

# Aye Aye Captain!

Captain Woodget has been taken ill and we need your help! Do you have what it takes to become the new Captain of the Cutty Sark? We have come up with a pack of 6 tasks to put you to the test. When you have finished all the tasks, fill in this page with your results.

## Which way Captain?



Starting point: \_\_\_\_\_

Destination: \_\_\_\_\_

Route plotted: Y / N

Map completed: Y / N

Don't forget to keep your log book!

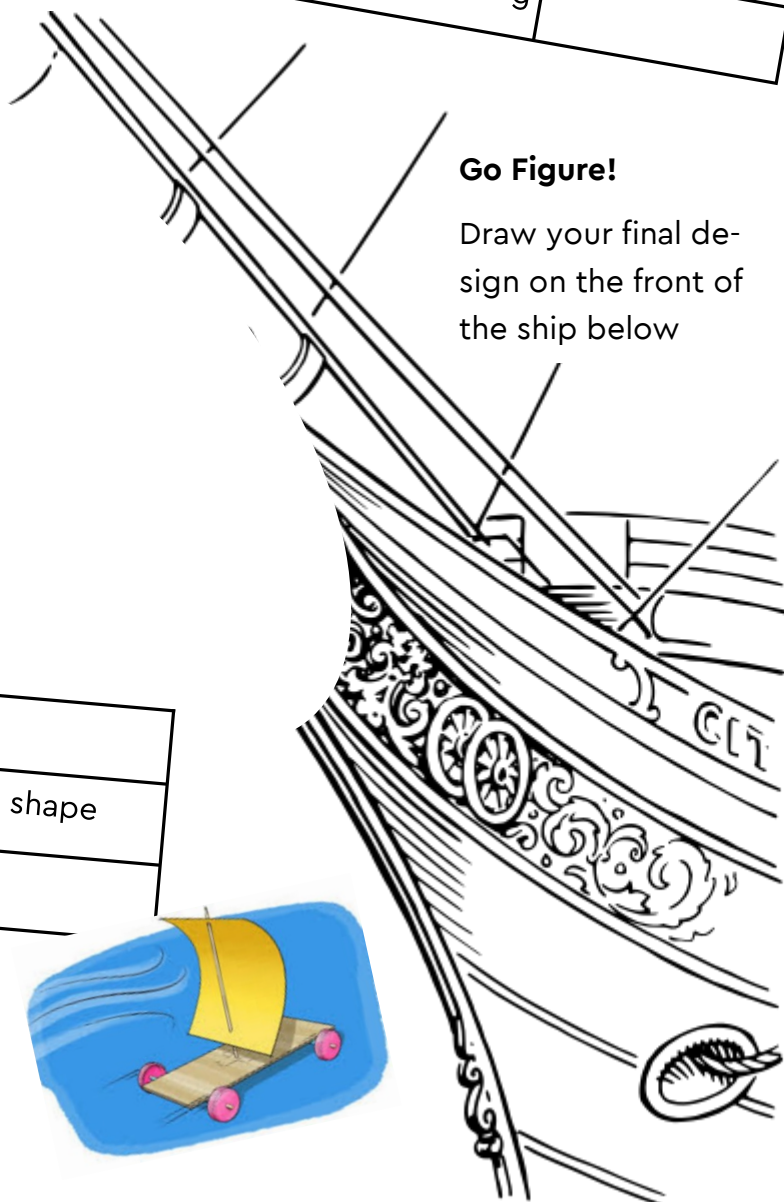


## Don't Tip the Ship

| Largest size | Max. weight | Best material |
|--------------|-------------|---------------|
| Cm           | g           |               |

## Go Figure!

Draw your final design on the front of the ship below

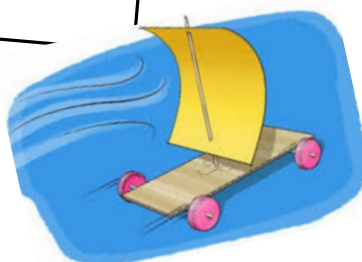


## Make it Go!

| Best wheels | Best sail | Best shape |
|-------------|-----------|------------|
|             |           |            |

Total number  
of letters  
read

|  |
|--|
|  |
|--|



Captain

's Log Book



First things first! Aboard the Cutty Sark, Captain Woodget would keep a log book as a record of his journey. He would record things such as the food he ate, the time, date, weather, destination, and passengers (especially if they made any great achievements, or were particularly badly behaved!)

So, to become a Captain, you must try to keep a daily log using the booklet below. Just jot down the things you do each day.

**Location**

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**Date started**

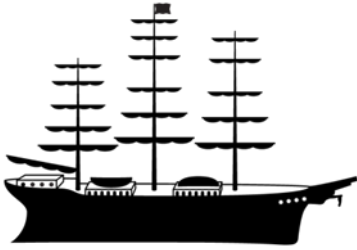
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**Date started**

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# Food on board

*What have you had to eat today?*

*Did you help with the cooking?*

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
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- \_\_\_\_\_



# Make it Go!

Have you ever seen a big ship sail across the sea?

The Cutty Sark was built in 1869 to transport tea from China to London.

The ship is a Tea Clipper which means it was built to move very quickly.

In fact, the Cutty Sark was one of the fastest Victorian Tea Clippers in the world!



That's longer than an Olympic sized swimming pool and heavier than 75 London buses!

The Cutty Sark is a sailing ship, which means it uses sails mounted on two or more masts, to harness the power of wind and move the ship forward.

Although today in 2020, sailing ships are far less popular than they were in the 1800s, they are starting to make a comeback as a more eco-friendly way of trading.

Let's have a go at building our own wind powered vehicle.

## Equipment list

- A piece of thick cardboard
- Wooden skewer or toothpicks
- Paper straw
- Polo mints or bottle tops with a hole drilled through the middle
- Sellotape
- Sheet of paper
- Bluetac
- Wind source (electric fan, set of lungs!)
- Things for decorating

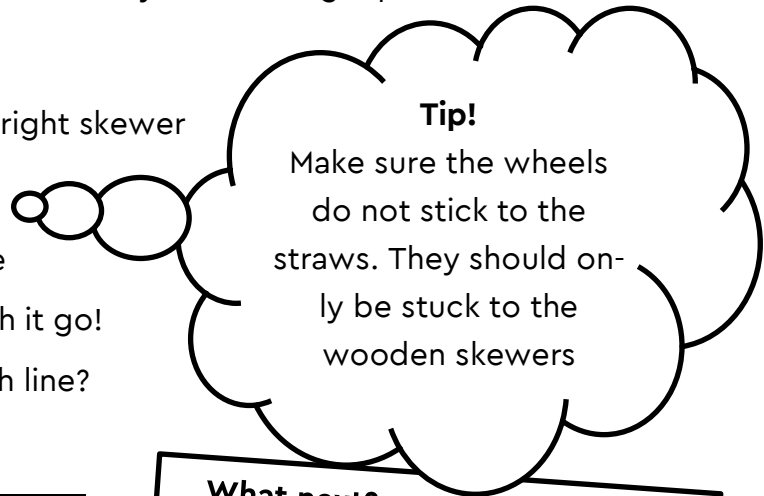
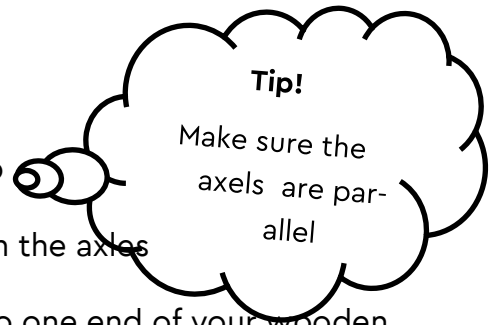


## THE FACTS—use this table to record your results

| Cutty Sark              |                     |                         |  |
|-------------------------|---------------------|-------------------------|--|
| Length                  | 280 feet            | Length                  |  |
| Weight                  | 963 tons            | Weight                  |  |
| Top record-<br>ed speed | 17 knots<br>(20mph) | Top record-<br>ed speed |  |

# Method

1. Cut out a piece of cardboard to form the body of your ship
2. Tape your two straws onto the bottom of your ship to form the axles
3. Now we need to attach your wheels. Stick a polo mint onto one end of your wooden skewer
4. Slide the other end of your skewer through one of your straws and stick a polo mint to the end of the skewer opposite to the first polo mint.
5. Repeat this for the other straw
6. With both sets of wheels complete, your ship should move smoothly across a hard surface with just a small push. Adjust the wheels until it does so.
7. To attach the sail, you need to make a small hole in the centre of the ship's body and stick a skewer securely into it using tape. This will form the mast.
8. Use paper to create a sail and poke the upright skewer through both ends to hold it in place.
9. Measure out 1 meter on the floor. Place the ship in front of your wind source and watch it go!  
How quickly does your ship reach the finish line?



| Materials used (sail/wheels) | Top speed recorded |       |       |              |
|------------------------------|--------------------|-------|-------|--------------|
|                              | Try 1              | Try 2 | Try 3 | Mean Average |
|                              |                    |       |       |              |
|                              |                    |       |       |              |
|                              |                    |       |       |              |

**What next?**

Why don't you try making a faster ship? You can have a race and use our template to record your findings.

Change the shape to increase or decrease the speed and stability of your ship.

What material makes the best sail?

Could you use different wheels?



# Don't tip the ship!

Cargo ships have been around for thousands of years, transporting goods around the world.

The Cutty Sark was built in 1869 to bring tea from China to London. The ship could carry 10,000 tea chests, and these contained enough tea to make over 200 million cups of tea—do you think you could drink that much tea in a lifetime?



In this activity, you will work scientifically to build boats and investigate how much weight can be added to the boats before they sink.

## Method

1. Fill a tub or tank with water. Place on a mat or tray to minimise the amount of water spillage.
2. Take a piece of squared paper
3. Create a square of  $6 \times 7$  squares. Cut this out as shown below.
4. Fold up the four sides (shown in yellow). Tape the corners together to make it watertight.
5. Count the number of squares in the base of the boat and make a note of this in the table below.
6. Gently place the boat in the tub of water, it will float!
7. Add weights one after the other until the boat sinks. For best results, place the weights equally and systematically around the boat. Record your results in the table below.
8. Repeat the experiment and compare your results.
9. Now try different designs. Does the size or shape of the boat change how many weights it can hold? The only limit is the size of the tub!



### Equipment list

- 1cm<sup>2</sup> Squared paper
- Ice cream tub, or any tub or tank
- Small weights or coins
- Sellotape
- Scissors
- Optional extra materials for boat building e.g. foam, foil, plasticine

In real ships the weight is carefully spread across the ship to prevent tipping.



### What next?

How does the volume of a boat affect how much cargo it can carry without sinking?

Why not use different materials to make and test your boats?

Gather evidence - Record your results in the table below.

If you have time, you could repeat your experiments to check your results!

|  |    |    |    |    |
|--|----|----|----|----|
|  |    |    |    |    |
|  | 1  | 2  | 3  | 4  |
|  | 5  | 6  | 7  | 8  |
|  | 9  | 10 | 11 | 12 |
|  | 13 | 14 | 15 | 16 |
|  | 17 | 18 | 19 | 20 |
|  |    |    |    |    |

| Surface area of boat (cm <sup>3</sup> ) | Mass added before the boat sank (g) |       |       |              |
|---|-------------------------------------|-------|-------|--------------|
|   | Try 1                               | Try 2 | Try 3 | Mean Average |
|   |                                     |       |       |              |
|   |                                     |       |       |              |
|   |                                     |       |       |              |
|   |                                     |       |       |              |
|   |                                     |       |       |              |

### Conclusions

# Go figure!

Ships had figureheads for good luck. These statues would go right on the front of ships.

*Cutty Sark's* figurehead is a witch called Nannie, who is holding a horse's tail in her hand. *Cutty Sark's* name is taken from a poem, *Tam O'Shanter*, by Scotland's most famous poet, Robert Burns. In the poem, Tam, a farmer, is chased by a beautiful and fast witch called Nannie who is wearing a 'cutty sark' (a scottish term for a short undergarment or shift).

Jock Willis, *Cutty Sark's* owner, wanted his ship to be the fastest ship in the world, so he chose Nannie as *Cutty Sark's* figurehead as she was a fast witch.

<https://www.youtube.com/watch?v=3cRfweZCMQ> (Tam O'Shanter poem)

Here are some more examples from *Cutty Sark's* collection...



My figurehead name is...

Draw a picture of your figurehead

My figurehead is special because...

Which ship does my figurehead go on?

Create a story about your figurehead.  
What happened on its journey out at sea?

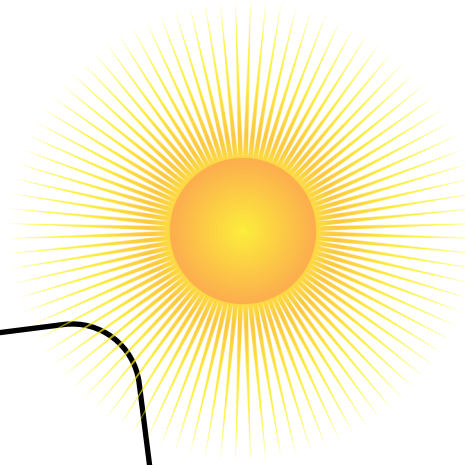
Using materials you have in your home to make your figurehead.

# You've got mail

Sailors and Captains alike would spend months on board ship, with little to no contact with their family and friends. This meant that letter writing was a frequent and often necessary to keep in contact with the rest of the world – there were no mobile phones 151 years ago!

We are lucky enough to have copies of letters written from one of our apprentices called Clarence Ray to his mother.

Below are a few extracts from different letters that Clarence wrote. He talks about his life on board the Cutty Sark, how he feels and what he is thinking. Read through as many as you can, and try to answer the questions below each extract.



25 June 1894.

My dear Mother,

**The pilot** leaves tonight I expect so I am writing this short note now in case I get no more time. I am quite well and enjoying myself. The weather is beautiful but hardly any wind. We are running about **5 knots** at present. I hope you and all at home are getting on all right. I have just been **hauling on the t'gallant halliards** and therefore the writing is very bad.

I must stop now our time for breakfast is nearly up.

Don't forget to write to me

Your loving son

Truly

C. E. Ray



What is the name of the sailor who wrote this letter?

---

Who is he writing to?

---

What was the weather like?

---

Why is the sailor's handwriting very bad?

---

Why did the sailor have to stop writing?

---

Sunday 15th of July 1894

My Dear Mother,

I have not **commenced** keeping a **log book** yet, so I am going to write a sort of weekly letter to tell you all about the ship and how I get on.

We start work at 5.30 in the morning. In our **watch** on deck at night we have to keep time and ring the bells - **the old man** has got 3 dogs, and when we go down in the cabin, they go for us which makes it **rather thick**.

Now I must tell you about the **grub**.

Monday and Wednesday: pea soup and pork

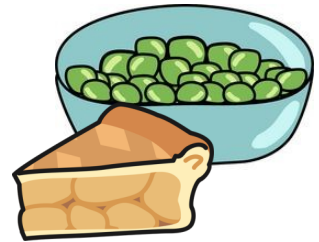
Friday and Tuesday: **Salt Tram Horse** and bread

Thursday and Saturday: **Junk and Spuds** (potatoes)

Sunday: **Leu pie**

We get a **pannikin** of lime juice every day at 12 o'clock.

Leu pie is my favourite dinner. It is cooked altogether in a great **kid**, fresh meat and spuds and dough on the top. Oh Lord, I could eat 3 **whacks** of it now, of course, we get any amount of **dog biscuit**. We shall finish the last piece of cake today for tea. We have kept it 3 weeks which I think is a long time.



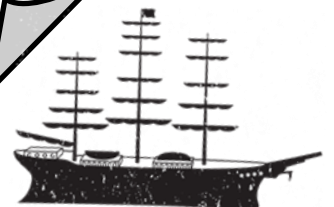
What date is this letter written?

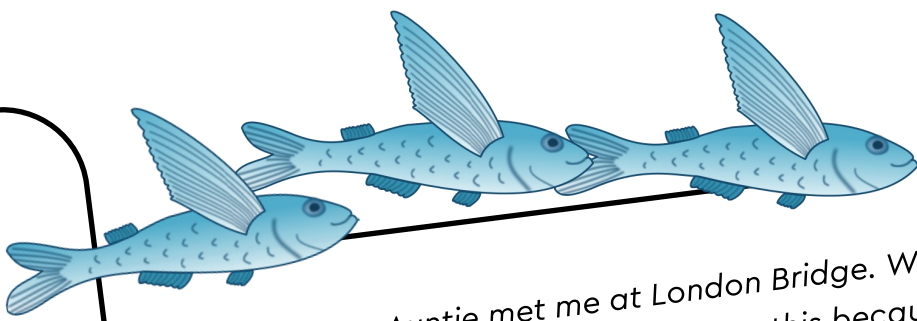
What time does Clarence start work in the morning?

How many dogs does the Captain have?

On what day do the crew eat a fresh meat pie?

What did the crew eat the last of on the day Clarence wrote the letter?





Auntie met me at London Bridge. We had Yorkshire pudding for Sunday's dinner, I just mention this because it shows how thoughtful Auntie was.

Then the next morning we heaved the anchor and set sail for the deep blue sea... I chip, repair, paint and generally do up! Unluckily the captain found out that I knew more about engine work than any of the other **'prentices** and so he has had me helping him nearly all the time since we left London.

We have had fine weather, it is getting very warm I never have more than a shirt and pants on ever at night. We get any amount of **flying fish**, they fly aboard at night, then all we have to do is catch them, cut their heads, wings, tails and fins off, clean them and then put them on a plate with some butter over them, and give them to Jimmy to cook for our breakfast. Last night I caught thirteen.

Our first job at 5.30 in the morning is to wash the pigs and closets out. I always heard that pigs were unclean animals but now I know it for a positive fact and can prove it too.

Ah it is a hard life but you need not think that I do not like it, for I am enjoying myself very much. Last week I had to go to the wheel and learn to steer.

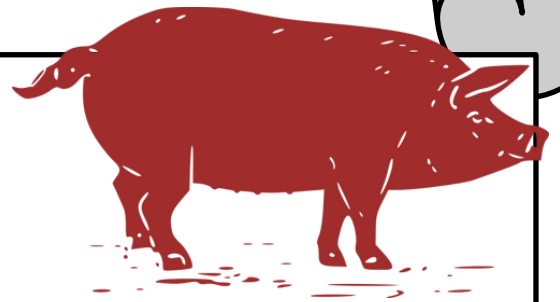
I am always thinking of you all at home and I know I shall be jolly glad to get back and see you all again.

Where did Clarence meet his Auntie?

What time did Clarence start washing the pigs?

Would you like to have this job? Why?

Does C.E Ray enjoys being on the ship? Justify your answer using evidence from the text.





18th Sept. 1894

My Dear Mother,

We have arrived here all safe and sound having **made a passage** of 80 days... I received your kind letters last night at 8 o'clock. I was very glad to hear that you enjoyed your holiday.

Now I suppose you want to know how I am. Well I am alright and **getting a muscle on me like a horse** and you will be glad to hear that I have not had a day's illness of any kind since I have been aboard the ship. Not even a headache.

I have kept a full account of every day's doings in the log... In my next letter I will give you a full account of this delightful country and I will send a description of the strange houses, flowers, trees, birds, fish, sunsets, etc. etc.

I must **knock off** now so expect a long letter next mail from,  
Your loving sailor boy

What do you think 'getting muscle on me like a horse' means?

Has he been ill at all during his time away? How do you know?

What 'strange' things has Clarence seen?

Who do you think Spot is? Why might Spot enjoy sea biscuits?





25.11.1894

My Dear Mother,

You will see by this that I am still alive and well. You have been expecting a letter from me before this, but I have put it off until now.

I am glad to hear you are getting on alright, and Aunt is a little better. I am always mending, sowing bottoms on, and washing. I have made a hammock since I have been in port and will fix it up over the grass plot in front of the window for you to lay in. It is rather warm here (98 in the shade) I cannot believe it is Christmas here.

We are coming to London direct so you won't be able to write to me at any port on the way.

You must not **fret** about me mother dear, I shall be home in about 75 days after you get this. I long to be at sea again and homeward bound.

I must knock off now and turn in as it is getting late.

Excuse bad writing and spelling. Hurrah for a **quick passage** and **fair wind**.

I am your loving son,

C. E. Ray

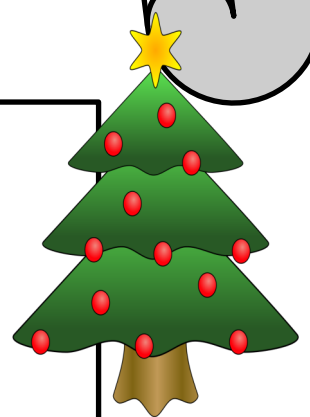
P.S. You cannot tell how I look forward to the mail day, every week.

What has C. E Ray made while he has been on board the ship?

What time of year is it when this letter is written?

How long after Mother received the letter was Clarence due to come home?

How often does his Mother write to him? Use the last line of the letter to help you





How many questions can you answer about the letters? Don't forget, there is a handy glossary at the bottom of the page.

Now you have read through Clarence's letters it's time for you to have a go at writing a letter too.

You could either imagine you are on the Cutty Sark with Clarence, or you could write about your experiences at home! It is up to you. Perhaps you could even send it to a friend – in the post or via email.

In the letter you should remember to tell your friend about what you have been doing, how you are feeling and what is going on around you. Just like Clarence did!

You could use your log book that you have been keeping so you don't forget any im-

### **Glossary**

**commenced** = began

**rather thick** = chaotic, busy

**Grub** = food

**Salt Tram Horse** = salted beef

**Junk and Spuds** = old meat and potatoes

**Pannikin** = a small metal drinking cup

**Whacks** = a large quantity or amount.

**'prentices** = apprentices = a person who is learning a job having agreed to work for low wages.

**of flying fish** = a fish that leaps out of the water using winglike fins to glide over the surface

**ashore** = on land as opposed to at sea

**fret** = to worry

### **Maritime Glossary**

**The pilot** = a sailor who moves ships through dangerous waters, such as harbors or river mouths

**5 knots** = the speed at which ships travel (like miles per hour for cars)

**hauling on the t'gallant halliards** = hoisting the sails

**watch** = assignment of sailors to specific roles on a ship to operate it continuously

**the old man** = the captain

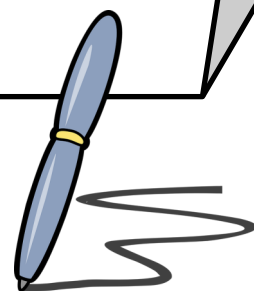
**we crossed the Line** =

**a quick passage and fair wind** = a fast journey and good wind

**knock off** = finish

**take a peep at you** = to see you

# Thank you Captain!



# Which way captain?



**Finish the map by adding:**

Continents

England and China

Compass points

The equator

Weather symbols



The Cutty Sark had to race against other ships to get to China as quickly as possible and pick up lots of tea to bring back to England. The journey to China and back again to England took about 9 months.

You are now the Captain of the Cutty Sark, so it is your job to plot the route! Look at the map.

Which way will you go to get to China quickly?

Discuss the different routes you can take around the world. What are the dangers involved on these routes? Think about the weather.