

MEET YOUR GUIDE VETRA



CAPTAIN'S COVE



03



THE SECRETS OF SAILS AND STEERING!

Ahoy, young explorer! You've arrived at Captain's Cove, the third island on your Sailing Into STEAM adventure. Have you ever wondered: How do sails make a boat move without an engine? Why are some sails tall and skinny, while others are wide and flat? How do sailors turn their boats and know which way to go?

"Ahoy, captain! Here at Captain's Cove, we test our sails, practice our turns, and chart our journeys. To leave this island, you'll need a clever sail, steady hands at the helm, and a navigator's brain!" "Every sailor knows: catching the wind is just the start—you also need to steer your boat and stay on course! Let's learn the secrets of sails, steering, and bearings together."



MISSION 1 : DESIGN THE BEST SAIL

Every great sailor needs a great sail! Today, you'll become a sail designer—testing shapes and materials to see which one moves your boat the fastest. You'll need to think like an engineer and an artist. Are you ready, Captain? Let's set up your sail workshop!

Your Challenge: Build different sails for your boat using recycled materials.

- Test which sail shape catches the most wind.
- Find out which one makes your boat go the furthest or fastest!

What You'll Need:

- Recycled paper, old cloth (like T-shirts or scraps), plastic bags, or old sails
- Scissors
- Lightweight sticks (like straws, twigs, or chopsticks)
- A boat base (plastic bottle, cardboard, or small piece of wood)
- Tape or eco-friendly glue
- Optional: paint to decorate your sail

Step 1: Build Your Sails

- Use your materials to build at least two different sail shapes.
- Attach each sail to your boat base with sticks or straws.
- Make sure all boats are about the same size so it's a fair test!

"A curved sail might need extra sticks or tape to hold its shape."

Step 2: Test Your Sails

- Fill a shallow tub with water—or use a smooth floor with a fan as your wind
Place your boat at the starting line
- Turn on the fan or blow gently to create wind
- Watch how far and fast the boat sails!

👉 Record your results:

Sail Shape	Distance Traveled	Notes (fast, slow, wobbly?)
_____	_____ cm	_____
_____	_____ cm	_____
_____	_____ cm	_____

Repeat each test two or three times for fairness.

Step 3: Reflect and Improve

👉 Write your discovery:

"The best sail was _____ because _____."

👉 Could you make your sail better? What would you change?

"Next time, I would _____."

"Well done, Captain! You've learned the first secret of Captain's Cove—the sail makes the journey possible! But the adventure's just beginning... Next, we'll see how to use the wind's power to steer your boat!"

MISSION 2 : USING WIND POWER TO MOVE YOUR BOAT

Now that you've built your sails, it's time to learn how to use the wind to steer and speed up your boat! Did you know the wind doesn't always blow from behind? Sailors have clever ways to move forward—even when the wind is coming from the side!

"A square sail works best when the wind blows from behind. But a triangle sail can help a boat move even when the wind comes from the side!"

Today, we'll test how sail shape and sail angle change the way your boat moves.

Your Challenge: Test both different sail shapes and different sail angles to see:

- Which combination makes your boat move the fastest?
- Which lets you sail in different directions?

What You'll Need:

- Your boat bases from Mission 1
- At least two different sail shapes: Square sail, Triangular sail
- A fan (or gentle blowing for wind)
- A shallow water tub or smooth tabletop
- Tape or markers to make a starting line and finish line
- A timer or stopwatch

"Make sure the wind (fan) blows the same each time so it's a fair test!"

Step 1: Make Predictions

- The wind is blowing from the North
- The goal is to move the boat toward the East

Which sail shape and angle do you think will help the boat move closest toward the East?

Think about these sail positions:

- Pulled tight (close to the middle)
- Halfway open (angled to the side)
- Wide open (almost sideways)

👉 **Write your prediction:**

"I think the sail at _____ angle will get closest to the target because _____."

Points of Sail

When the wind is blowing, sailors have different names for how the boat faces the wind. These are called Points of Sail:

- Close-Hauled: sailing almost into the wind (tight sail angle)
- Beam Reach: sailing with the wind hitting from the side
- Running: sailing straight with the wind from behind.

Each point of sail needs a different sail angle to work well—and not every sail shape can do them all!

MISSION 2 : USING WIND POWER TO MOVE YOUR BOAT

Step 2: Set Up Your Test

- Attach the square sail to one boat
- Attach the triangle sail to another boat
- Mark: An arrow showing wind direction (North) and A line showing the target direction (East)
- Put the fan so it blows from North toward South

“Do you think the square sail will let the boat go toward the East if the wind is coming from the North?”

Step 3: Test Each Sail Shape and Angle

Start with the square sail:

- Test with the sail wide open
- Test with the sail halfway open
- Test with the sail pulled tight

Watch: Does the boat move? Does it go toward the target or only downwind?

Now test the triangle sail:

- Wide open
- Halfway open
- Pulled tight

Watch: Does it move closer to the East? Does it drift straight, sideways, or spin?

👉 Write down what happens:

Repeat each test 2-3 times for fairness.

Sail Shape	Sail Angle	Did It Move? (Y/N)	Speed (Fast/Medium/Slow)	Direction Reached (Downwind? Sideways? No Movement)
Square	Wide open			
Square	Halfway open			
Square	Pulled tight			
Triangle	Wide open			
Triangle	Halfway open			
Triangle	Pulled tight			

Which combination helped your boat move closest toward the East?

👉 Write what you discovered: The best combination was to sail at _____ angle with sail _____ shape.

Square sails are great if the wind is pushing you straight from behind. But if you need to go sideways or a little toward the wind, triangle sails are the key! Sailors adjust the angle of triangle sails to steer their boat in different directions—even when the wind doesn't blow them straight to the treasure.

MISSION 3 : TACKING AND JIBING

Captain, now that you've learned how sails work, it's time to master the art of turning the boat! When the wind's blowing from ahead or from the side, you can't just steer straight. Sailors have special ways to turn their boats without flipping them over or losing the wind.

Today, you'll practice two special maneuvers:

- Tacking → turning the front of the boat through the wind
- Jibing → turning the back of the boat through the wind

Your Challenge:

- Practice tacking and jibing using a boat on land
- Learn how to work the tiller (steering stick) and mainsheet (sail rope) together
Understand how your weight and actions help the boat turn safely

"Every turn needs teamwork between the tiller, the sail, and your body!"

What You'll Need:

- An Optimist dinghy (secured safely on a dolly, stand, or trailer)
- A fan (or an arrow marker) to show wind direction
- Chalk or tape to mark the ground (compass rose or 'no-go zone')
- A helper (instructor or friend) to call instructions
- Optional: a whistle or bell to signal turns

Step 1: Make Predictions

"If the wind is blowing from ahead and we want to sail across it, can we go straight into the wind?"

✎ Write or say your answer:

"I think _____."

Step 2: Practice Tacking (Turning the Bow Through the Wind)

- Sit inside the boat, holding the tiller and mainsheet
- Instructor shows where the wind is blowing from
- Instructor calls

"Ready about!" → You get ready

"Helm's a-lee!" → You push the tiller away from you to turn the front of the boat into the wind

- As the boat "turns," move the mainsheet across to the other side
- Shift your body to the new side of the boat (pretend to duck under the boom!)

"Move the tiller enough to turn, but not too much to make a big slow loop!"

- Practice this 2-3 times
- Each time, check: Did the tiller move the right amount? Did you move the sail at the right time? Did you move your body safely?

✎ Write what worked:

"When I tacked, I did _____."

✎ Write what was tricky:

"Next time I want to improve _____."

MISSION 3: TACKING AND JIBING

Step 3: Practice Jibing (Turning the Stern Through the Wind)

- Sit in the boat, facing downwind (wind behind you)
- Instructor calls: "Prepare to jibe!" – You check around "Jibe-ho!" – You pull the tiller toward you to turn the back of the boat through the wind
- Quickly control the mainsheet as the sail swings across fast
- Move your body to the new side of the boat safely

"Watch out! The sail moves faster when jibing—always hold the mainsheet!"

- Practice this 2–3 times
- Each time, check: – Did you move the tiller enough? Did you control the sail safely? Did you move your body to stay balanced?

✎ Write what worked:

"When I jibed, I did _____."

✎ Write what was tricky:

"Next time I want to improve _____."

"Which turn felt easier—tacking or jibing?"

✎ Write or say your answer:

"I thought _____ was easier because _____."

"Which turn made the sail move faster?"

✎ Write or say your answer:

"The sail moved faster during _____."

"Tacking is safer in strong winds because the sail moves slower. Jibing is faster but needs more control because the sail can swing hard!"

BONUS MISSION : NAVIGATE WITH A COMPASS AND BEARINGS

A good sailor doesn't just sail with the wind—they also navigate their way! When you're out at sea, a compass helps you know which way to go, even when there are no signs or roads." "Today, you'll learn how to use a compass and bearings to steer toward your treasure!"

Your Challenge:

- Learn how a compass works
- Follow simple bearings (directions in degrees) to reach your goal
- Practice steering a course like a real sailor or explorer!

"Every bearing is like a secret code showing how many degrees to turn from North!"

What You'll Need:

- A compass (or a compass app)
- A simple treasure map with bearings and steps
- Chalk or tape to mark a compass rose on the ground
- Cones or objects as waypoints (hidden clues or tokens)

Step 1: Learn How a Compass Works

- "The red needle always points North."
- "North is 0° , East is 90° , South is 180° , West is 270° ."
- "A bearing tells you how many degrees to turn from North to face your path."
- Practice pointing the compass to North.
- Try facing 90° (East), 180° (South), 270° (West).

✎ Write what you learned:

"North is _____. East is _____. South is _____. West is _____."

Step 2: Practice Simple Bearing

- Use chalk or tape to mark N, E, S, W on the ground in a circle.
- Stand in the middle holding the compass

Vetra gives commands:

✎ "Face 0°!" (North)

✎ "Turn to 180°!" (South)

✎ "Turn to 270°!" (West)

Try small angles too:

✎ "Face 45°!"

✎ "Face 135°!"

✎ "Face 225°!"

"Each bearing tells you a direction, like a number puzzle leading to treasure!"

Step 3: Navigate a Mini Treasure Map

Now it's time to use your compass for real. Your team will get a simple treasure map. On it, you'll see:

- A starting point
- A list of bearings and steps to follow (like secret directions!)
- Clues or hidden objects along the way

How to Play:

- Start at your marked Starting Point.
- Check your map: what's the first bearing (degrees) and how far do you need to go?

Use your compass:

- Set the bearing (point it in the right direction!)
- Face that way and get ready to move
- Walk the distance (count your steps or measure)
- Look around at the waypoint—did you find a clue or object?
- Follow the next bearing and keep going until you reach the treasure!

When you reach the final spot, celebrate your treasure-hunting skills!

"Stay focused on each bearing—like a real sailor steering across the sea. Keep your compass flat and steady, and don't let anything distract you!"