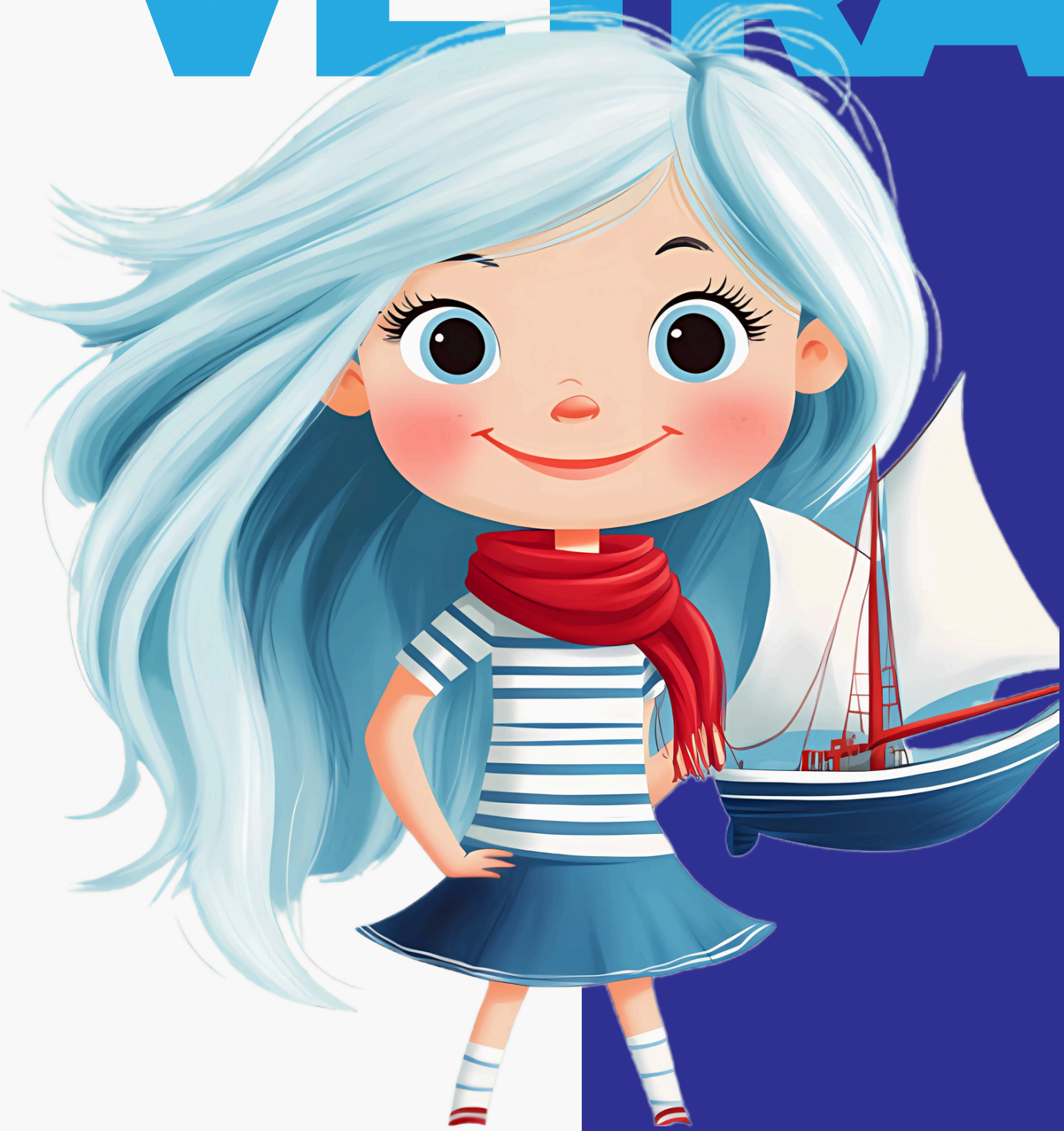
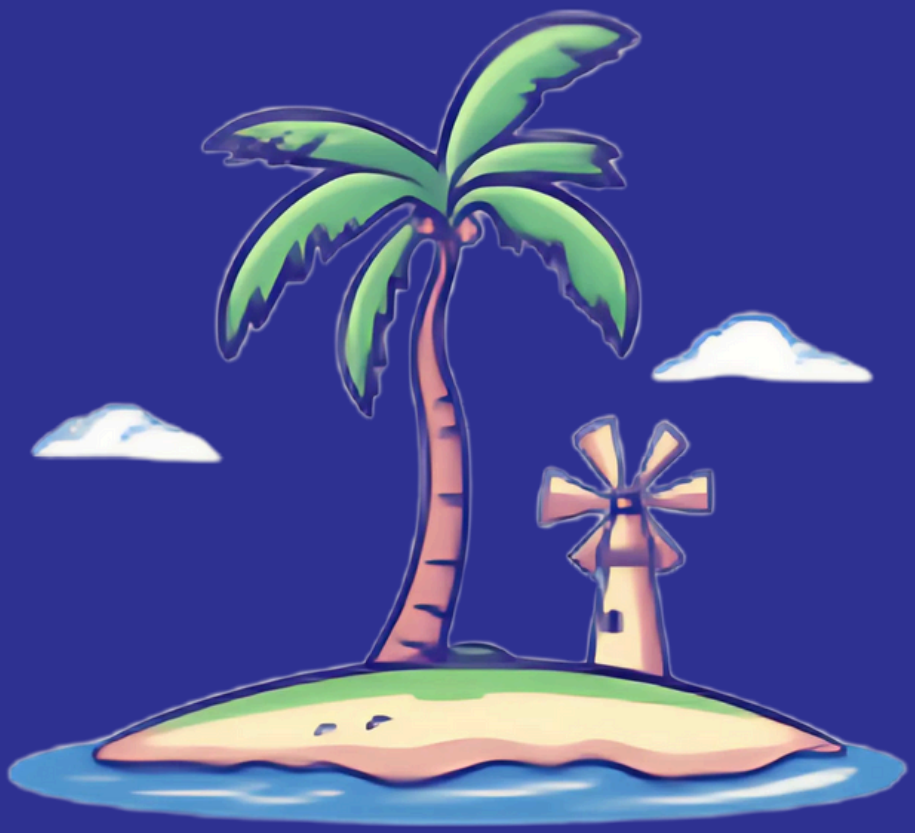
MEET YOUR GUIDE

VETRA



BREEZY ISLAND



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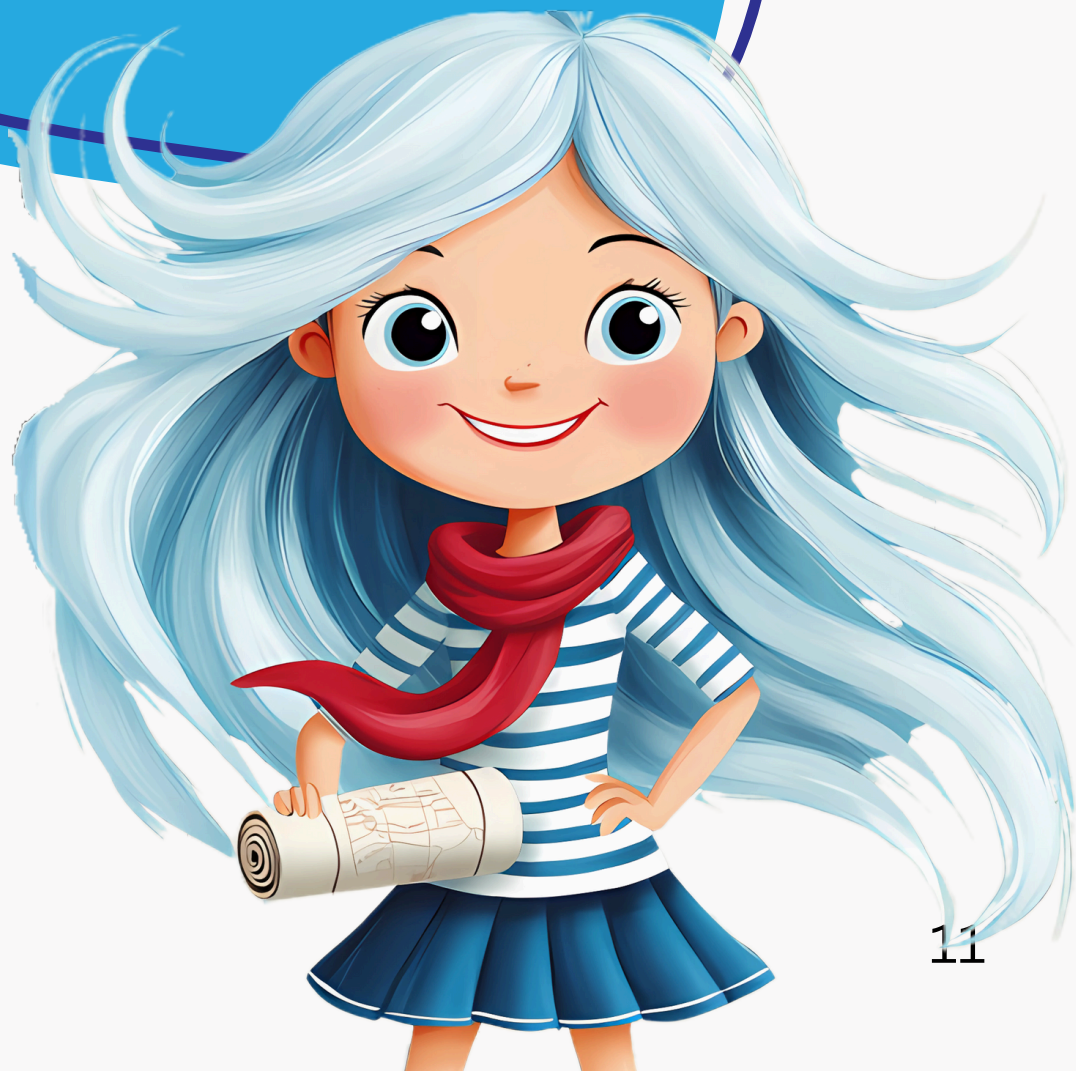
You've landed on Breezy island, the first stop on your Sailing into STEAM adventure. Here, we'll discover the secret of the invisible force that moves sailboats— the WIND! Can you feel the wind on your face? Can you see it moving leaves and flags? Today, we'll learn where wind comes from, how we can see it, and how we can use it.

"Ahh, the wind—my favorite travel companion! Ever wondered where it's born? Join me, and we'll chase the breeze and unlock its secrets together! Watch for my blue square messages—they'll guide you and reveal secret tips along the way!

Let's explore the invisible wind together!"



MISSION 1: WHERE DOES WIND COME FROM?

Did you know the sun helps make the wind?
Let's find out why air moves!

Watch your educator set up two containers:

- One has water.
- One has sand or rocks.
- Both are sitting under a lamp.
- There's a thermometer in each container!

"We're testing which one heats up faster!"

YOUR JOB:
👉 Check the thermometers after 5–10 minutes!
👉 Write the temperatures:
Water temperature: _____°C
Sand/Rocks temperature: _____°C

Can you explain why that happened?

When the sun shines, land heats faster than water. The air above the warm land rises, and cool air from over the water moves in. That moving air is what we call wind!"

Now for the BIG experiment!

We can't see air moving—but we CAN see water moving! Let's watch what happens when warm and cold meet!

Watch your educator set up a clear water tank:

- A warm stone on one side
- Ice cubes on the other
- Drops of red and blue color added near both sides

Predict:
👉 "What do you think will happen to the colored water?"
👉 "Which color will rise? Which one will sink?"

Draw your prediction:

cold color

warm color

Now watch the magic happen! Look closely as the colors start to move...
👉 Circle what you observe:
Warm color moves UP/DOWN.
Cold color moves UP/DOWN

"When warm air rises and cool air moves in to take its place... that invisible movement is WIND! It's air moving from heavier, cooler places (high pressure) to lighter, warmer places (low pressure). We used water and colors because air and water move similarly when heated and cooled! You just made invisible air movements visible!

MISSION 2 : HOW CAN AIR MOVE THINGS?

Have you ever felt the wind push against you?
Did you know air can actually hold things up?

First challenge: The Flying Paper Trick!

Take the thin strip of paper. Hold the paper under your mouth so it hangs down. Blow gently across the top of the paper (not underneath!). What happens to the paper? Does it move up or down?

👉 Write what you see. The paper moves:

_____

👉 Draw it here:

"When air moves quickly above something, the pressure underneath gets stronger – and that can lift light things, like a piece of paper!"

Main Experiment: The Floating Ball!

Your educator shows you:

- A hairdryer
- A ping pong ball

Watch closely!
The hairdryer is turned ON and pointing up. The educator gently puts the ping pong ball in the air above the hairdryer.

What happens? Does the ball fall?
👉 Write what you see:

The ball:

_____

Try it yourself! Take turns trying to keep the ball floating with the hairdryer.
👉 Can you tilt the hairdryer a little without making the ball fall? Did the ball stay in the air path when you tilted?

Super Challenge: Navigate the Course!

Now your educator sets up an obstacle course with hoops or rings. Try to move the floating ball through the hoops using the hairdryer. How many hoops did you pass? _____

"Thanks to the difference in pressure, air can create a special force that lifts or moves things. This force is called lift! That's how wind creates force in the sails that helps the boat move forward."

MISSION 3 : BECOME A WIND DETECTIVE!

Every sailor needs to know where the wind is blowing from and how strong it is. Today, you'll become a real wind detective by making your own tools!

You'll build:

- A Wind Vane (shows wind direction)
- An Anemometer (counts how fast the wind blows)

Step 1: Build your Wind Vane!

- Cut an arrow and tail from cardboard.
- Stick them onto a straw.
- Use a push pin to poke the straw onto a pencil eraser.
- Put the pencil into a bottle filled with sand or pebbles.
- Use a compass (or landmarks) to mark N, S, E, W on your base.
- Decorate your wind vane!

Step 2: Build your Anemometer!

- Your educator shows you how:
- Tape 4 paper cups onto the ends of 2 straws (in a cross shape).
- Pin the straws together in the middle so they spin.
- Put the pin on top of a pencil eraser (or stick in a base).
- Color your anemometer cups if you want!

Step 3: Time to Test Your Tools!

Take your wind vane and anemometer outside to find some wind.
OR stay inside and use a fan to create wind!

Watch your wind vane carefully:
Which way is it pointing? Use a compass to figure out the direction (N, S, E, W)!

👉 Write the wind direction here:

The wind is coming from:

Now watch your anemometer spin:
👉 Count how many times it spins in 10 seconds!
👉 If you're inside, hold it in front of the fan always at the same distance.

👉 Write how many spins you counted: Wind Speed Data Table

Trial Number	Spins in 10 Seconds
Trial 1	
Trial 2	
Trial 3	

Average number of spins:

"To find the average, add up all your spins and then divide by 3! Scientists do this to make sure their results are fair and accurate. If you need help with dividing, ask your educator to show you how!"

BONUS MISSION: THE WIND TUNNEL TEST!

Welcome to the Wind Tunnel Lab! Today, you'll be a wind scientist! We'll discover how air moves around shapes—just like it moves around sails and boat hulls.

Think about this:
👉 Have you ever felt the wind push against you when you're biking or sticking your hand out of a car window?"
👉 Was it harder when your hand was flat or turned sideways?"

"That's **drag** (when wind pushes back) and **lift** (when wind helps you rise). Designers use wind tunnels to test what shapes move best in the air. Now we'll try it too!"

Step 1: Meet the Wind Tunnel!

- Watch your educator turn on the wind tunnel.
- See how streamers show where the air goes.
- "The tunnel helps us see invisible air moving!"

Step 2: Make Your Prediction!

Pick a shape to test:

- Cube
- Sphere

What do you think will happen when the wind hits it?
Will the air flow smoothly or get stuck?

Step 3: : Test the Shape!

Put your shape inside the wind tunnel.
Watch what happens as we turn on the wind tunnel!

👉 Draw what you see here:

"How Does Air Move?

When air flows around a shape, it can move in two different ways:
✅ Smooth flow – when air moves straight, quietly, and without swirling. The smoke looks calm and flows around the shape like a river.
❌ Turbulence – when air gets confused, spins around, and forms little swirls. The smoke twists, breaks apart, and moves in all directions."

Step 4: What Did You Notice?

👉 Which shape had the smoothest air flow?

"Sails with the right shape help the wind create lift – so the boat can go faster! That's why shape matters!"

👉 If you were designing a sail, what shape would you choose? Why?

BONUS MISSION: USING THE POWER OF WIND!

Here you're going to use wind to make electricity and turn on a light! The Mission: You'll get a pre-built wind turbine and a tiny house model with an LED inside.

👉Your job is to be an energy engineer and:

- Connect the wires from the turbine to the house
- Build a tiny electricity grid
- Turn on the fan in front of the turbine
- Watch if the LED lights up!

Step 1: Set Up Your Grid

Your educator gives you:

- A prebuilt wind turbine (the blades are ready!)
- A house model with an LED inside
- Wires with clips

Use the wires to connect the motor (on the turbine) to the LED inside the house. Ask for help if you're not sure which wire goes where!

"Electricity needs a complete path to flow—make sure your grid is closed!"

Step 2: Power It Up!

- Place the fan in front of the wind turbine.
- Turn the fan on.
- Watch the blades spin.

Look carefully:
👉 Did the LED light up?
👉 How fast do the blades need to spin?

👉 Write what happened:

When I turned on the fan, my LED _____

_____

Step 3: Test and Improve!

- Try moving the fan closer or farther.
- Try tilting the fan to different angles.
- What changes helped the LED glow brighter?

"Wind energy can make electricity without burning fuel or polluting the air. It's a clean and renewable source of energy that helps protect our planet."