JUNE

Climate Awareness & Environmental Monitoring

This month focuses on understanding environmental conditions through data and observation. Students use sensors and simple tools to monitor factors like temperature and rainfall. They analyze patterns to better understand their local environment.

ACTIVITY 1: TEMPERATURE MAPPING BOARD

Materials Needed:

- LM35 temperature sensors x 4
- Arduino Uno
- 16 x 2 LCD or Serial Monitor
- Jumper Wires, Breadboard
- Tape + lebels for sensor placement
- Notebook for data recording

LEVEL 2 – SENSORS + DATA COLLECTION

STEP-BY-STEP INSTRUCTIONS:

PART 1: IDENTIFY LOCATIONS (MICROCLIMATES)

Step 1: Select 4 Zones

Choose 4 different areas in your school, such as:

- Shaded area (under trees or roof)
- Open ground/roof (direct sunlight)
- Classroom (indoor)
- Corridor (semi-open space)

These are called **microclimates** because each has different temperature conditions.

PART 2 : SENSOR SETUP

Components Needed

- Arduino Uno
- LM35 temperature sensors × 4
- Jumper wires
- Breadboard (optional)
- Tape/labels

Step 2: Understand LM35 Pins

Each LM35 has 3 pins:

- Left → VCC (5V)
- Middle → Output (Signal)
- Right → GND

Step 3: Place Sensors

- Fix one sensor in each zone using tape
- Label them clearly:

  Sensor 1 → Zone A
  Sensor 2 → Zone B
  Sensor 3 → Zone C
  Sensor 4 → Zone D

(Tip: Keep sensors shaded from direct sunlight for accurate air temperature readings)

Step 4: Connect Sensors to Arduino

- All sensors:

  VCC → 5V
  GND → GND
- Signal pins:

  Sensor 1 → A0
  Sensor 2 → A1
  Sensor 3 → A2
  Sensor 4 → A3

PART 3 : UPLOAD CODE

PART 4 : DATA COLLECTION

Step 6: Record Observations

For 3 days, record temperature at:

- Morning
- Midday
- Afternoon
- Evening

Day	Time	Zone A	Zone B	Zone C	Zone D
Day 1	Morning				
Day 1	Mid day				
.....					

PART 5 : DATA ANALYSIS

Step 7: Plot a Graph

- X-axis → Time of day
- Y-axis → Temperature
- Draw 4 lines (one for each zone)

Step 8: Compare Results

- Which zone is hottest overall?
- Which zone stays coolest?
- When does temperature peak?

PART 6 : REFLECTION & APPLICATION

Step 9: Think and Discuss

- Why is one area hotter than another?
- What factors affected temperature?
  Sunlight
  Ventilation
  Materials

CLICK FOR VIDEO TUTORIAL LINK : MICROCLIMATES - CONTRIBUTING FACTORS & EXAMPLES

ACTIVITY 2: DIY RAINFALL MEASUREMENT SYSTEM

Materials Needed:

- Transparent Plastic Bottle (1.5L)
- Ruler
- Permament Marker
- Funnel (or cut bottle top)
- Waterproof tape
- Data recording sheet

Level 1 - DESIGN & MEASUREMENT
(no electronics requirement)

STEP-BY-STEP INSTRUCTIONS:

PART 1: BUILD THE RAIN GAUGE

Components Needed

- 1 clear plastic bottle (1-2 L)
- Cutter/scissors
- Ruler
- Permanent marker
- Tape

Step 1: Prepare the Bottle

- Cut the top part of the bottle (just below the neck)
- Invert the top and place it inside the bottom half like a funnel
- Tape it securely so it does not move

Step 2: Create Measurement Scale

- Use a ruler to mark 1 cm intervals vertically on the bottle
- Label clearly: 1 cm, 2 cm, 3 cm, etc.
- Start marking from the base upwards

(Tip: Ensure the bottle is placed on a flat surface while marking for accuracy)

PART 2: SETUP FOR MEASUREMENT

Step 3: Place the Guage Outside

- Keep the bottle in an open area (not under a roof or under a tree
- Ensure:
  - It is upright
  - It cannot fall (use stones or tape to secure it)

PART 3: DATA COLLECTION

Step 4: Record Rainfall Daily

- Check the water level once every day at the same time
- Record:
  - Date
  - Water level (in cm)
  - Weather condition (light rain, heavy rain, cloudy, etc.)
- Create a table in your notebook and after recording, empty the bottle for the next day

Day	Rainfall (in cm)	Weather
Day 1		
Day 2		
.....		

PART 4: COMPARE WITH REAL DATA

Step 5: Check Accuracy

- Look up local weather data (news/app)
- Compare your readings:
  - Are they close?
  - What differences do you observe?
- Think about possible reasons:
  - Wind / Placement of bottle / Measurement errors

PART 5: APPLY THE DATA

Step 6: Calculate Rainwater Collection

Formula:

- 1 cm rainfall = 10 litres per m^2

For example:

- If rainfall = 2 cm
- Roof area = 200 m^2

Total water =

$2 \times 10 \times 200 = 4000$ litres

Now calculate:

- Total rainfall for 1 week
- Total water collected on the school roof

PART 6: REFLECTION AND DESIGN THINKING

Step 7: Think & Explore

- How much water is being wasted?
- Where could this water be stored?

Step 8: Idea Generation

List possible uses:

- Watering plants
- Cleaning floors
- Toilet flushing
- Groundwater recharge

CLICK FOR VIDEO TUTORIAL LINK : HOW TO MAKE A RAIN GAUGE

DESIGN THINKING MISSION: DEFINE THE PROBLEM

THE CHALLENGE:

Your monthly mission: Generate multiple solution ideas for your defined problem and identify the most promising one.
You now clearly understand the problem.
This stage is about thinking wide before thinking right.
Do not jump to the first idea.
Explore different possibilities, and then evaluate them based on impact, feasibility, and sustainability.

WHAT TO SUBMIT:

3 Distinct Solution Ideas:

Generate at least 3 different approaches to solve your problem:

- Each idea must be visually represented (sketch/diagram)
- Include a short explanation of how it works

Idea Comparison Table:

Compare your 3 ideas using the following criteria:

- Feasibility (Can you build it?)
- Impact (How much change can it create?)
- Cost (Is it affordable?)
- Sustainability (Does it reduce long-term harm?)

Best Idea Selection:

Choose your strongest idea and justify:

- Why this idea is better than the others
- What trade-offs you are accepting

Solution Flow

Explain your selected idea step-by-step:

- What happens first?
- What components are involved?
- What is the expected outcome?

Step	What to Do	How to Do it	Output
1	Revisit Problem	Clearly restate defined problem	Problem clarity
2	Brainstorm Ideas	Individually write 5 ideas each (no judging)	Idea pool
3	Group Ideas	Combine similar ideas into 3 distinct solutions	3 concepts
4	Sketch Each Idea	Draw diagrams showing how each solution works	Visual sketches
5	Explain Each Idea	Write short explanation (what + how)	Idea descriptions
6	Create Comparison Table	Compare on: feasibility, impact, cost, sustainability	Comparison table
7	Select Best Idea	Choose one based on strongest balance	Selected idea
8	Justify Choice	Explain why this is better than others	Justification
9	Create Solution Flow	Step-by-step: how the solution works	Flow diagram
10	Feasibility Check	List materials, skills, gaps	Feasibility list

Judging Criteria:

- Diversity of Ideas (25%) — Are the ideas meaningfully different, not minor variations?
- Problem–Solution Fit (25%) — Does the selected idea directly address the defined problem?
- Evaluation Rigor (25%) — Is the comparison logical and evidence-based?
- Feasibility Awareness (25%) — Is there a realistic understanding of what it will take to build the solution?