Welcome to
Social Studies Primary 4
Unit 2: Weather and Climate?

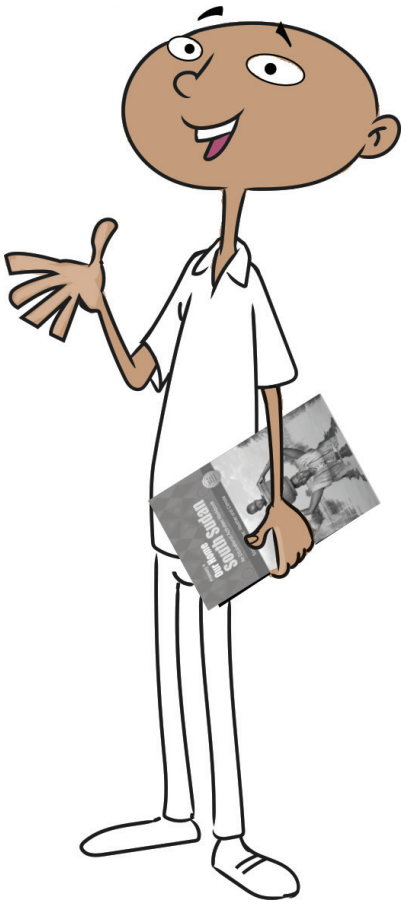
Activity 1: the purpose of the workbook

READ ALONE OR ALOUD AS A CLASS

In this workbook, you will learn about South Sudan's weather patterns. You will do this by looking at information and charts that describe weather across the year in South Sudan. You will set up a simple weather station and collect their own data about temperature and rainfall. You will use their own data and those of others to build accurate descriptions of weather patterns.

Using this workbook, you will be able to:

- Define the terms weather, climate, and climate change
- Explain how climate change is effecting on South Sudan
- Explain how weather is caused
- Set up a simple weather station
- Collect and record your own weather data
- Chart and describe the local weather in your area



Here are some key inquiry questions you should be able to answer by the end of the unit.

- What is the difference between weather and climate?
- What do you consider to be the most dangerous effects of climate change?
- Why is the study of weather important in South Sudan?
- What are the effects of weather changes on our environment?

IN PAIRS AND GROUPS

What are your thoughts as you read these questions?
Share your ideas about setting up your own weather station.

Activity 2: The differences between Weather and Climate

READ ALONE OR ALOUD AS A CLASS

Weather is the day-to-day of the atmosphere. For example, what are the weather conditions outside for today? Is it hot? Is it rainy? Is it cloudy and windy?

Climate is the weather conditions in an area over a long period of time. For example, South Sudan has a tropical climate with wet and dry seasons.

Climate change is a long-term change in the average weather conditions that make up your climate. For example, is South Sudan getting hotter each year? Is it raining more (or less) each year in South Sudan.

What is this symbol?

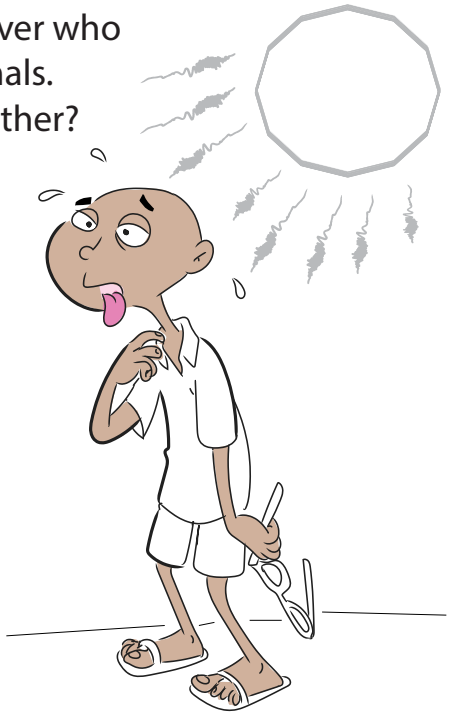
When you see this symbol, there is an important fact related to South Sudan's weather and climate.

IN PAIRS

Read this paragraph and then talk about these descriptions of the weather.

Sunny and Clear. When the weather is sunny, the Sun is shining bright. When it is sunny, we like to play and run outside. There are no clouds in the clear blue sky.

Hot. In the Summer, the weather becomes very hot. If the weather gets too hot, water dries up and our crops are ruined. Owners of cattle argue and fight over who gets to water their animals. Do you like the hot weather?



Activity 3: The Sun and the Earth

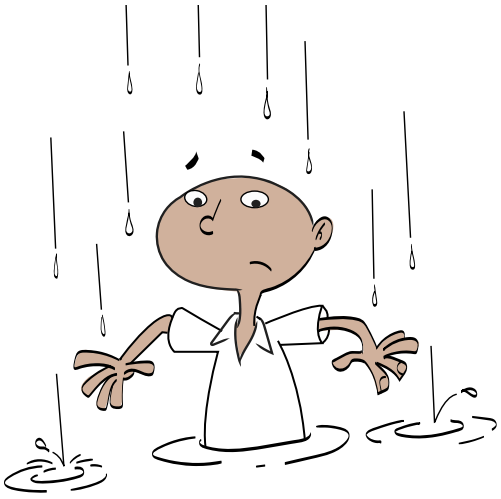
READ ALONE OR ALOUD AS A CLASS

Cloudy. When the weather is cloudy, it is cooler. The clouds help .... Sometimes, there may be a light rain.

Rain. In the rainy season, the sky is full of clouds and it begins to rain. Then, It rains and rains! If the weather rains too much, villages are flooded and our crops are ruined. Our roads become a muddy mess and impossible to drive on.

AS A CLASS

Share stories of how weather has effected your lives.



Activity 4: The Dry Season

READ ALONE OR ALOUD AS A CLASS

South Sudan has two seasons: a dry season and a wet season.

The dry season is the season of no rainfall. This is when people build homes and buildings. It is the time for harvesting our crops.

WORK IN PAIRS

Talk with another person about what you do in the hot, dry season.

Activity 5: The Wet Season

READ ALONE OR ALOUD AS A CLASS

The wet season is the season where there is series of rainfall.

This is when the farmers clear the land to plant their crops. People dig in the dirt to plant seeds that grow. In this photo, we see people pu

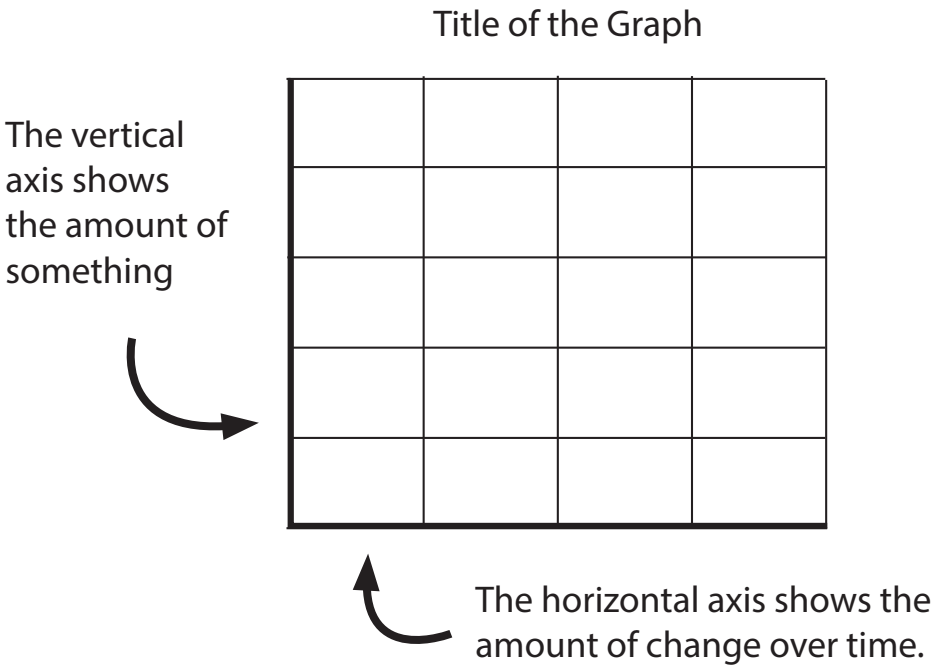
WORK IN PAIRS

Talk with another person about what you do in the wet season.

Activity 6: Learn to read a Line graph

IN PAIRS

A line graph is a chart that plots weather data. Data is information that is being collected.

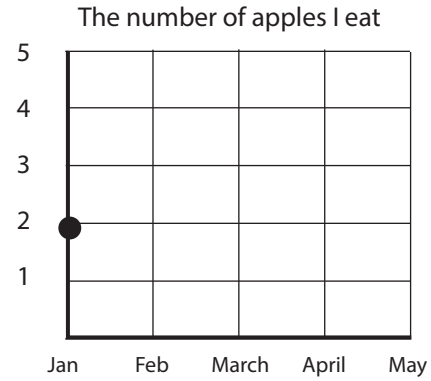


Next, you look at your information you want to put on the graph. This is called "plotting the data".

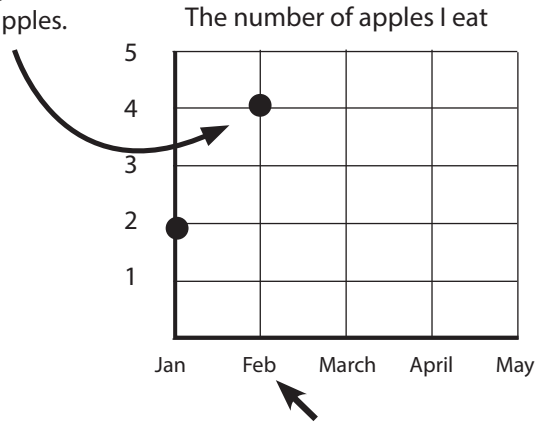
For our example, we want to plot the number of apples you ate.

- In January, I ate two (2) apples.
- In February, I ate four (4) apples.
- In March, I ate one (1) apple.
- In April, I ate three (3) apples.
- In May, I ate two (2) apples.

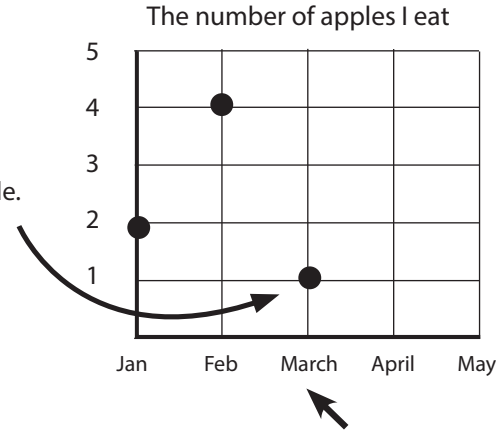
In January,
I ate two apples.



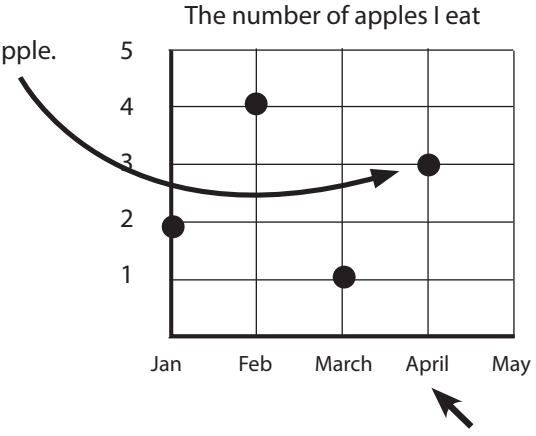
In February,
I ate four apples.



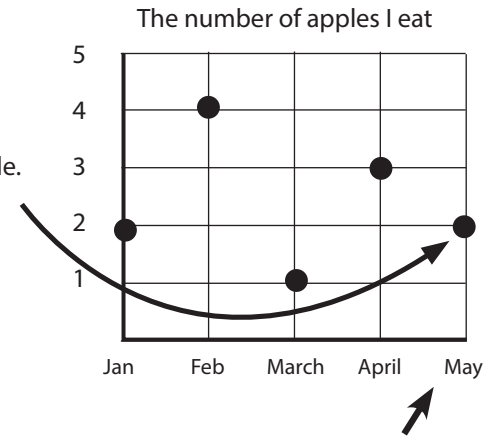
In March,
I ate one apple.

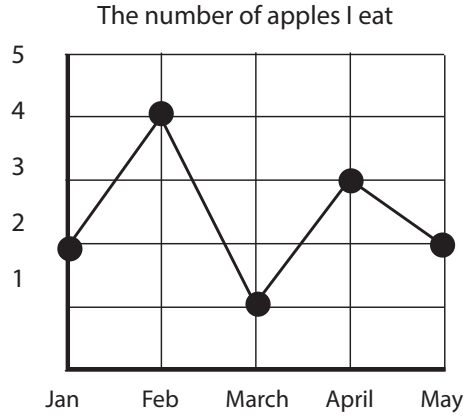


In April,
I ate one apple.



In May
I ate one apple.





When all the points are plotted on the graph, you draw a line connecting the dots.

Activity 7: Plot a line graph to chart Sunshine hours

IN PAIRS

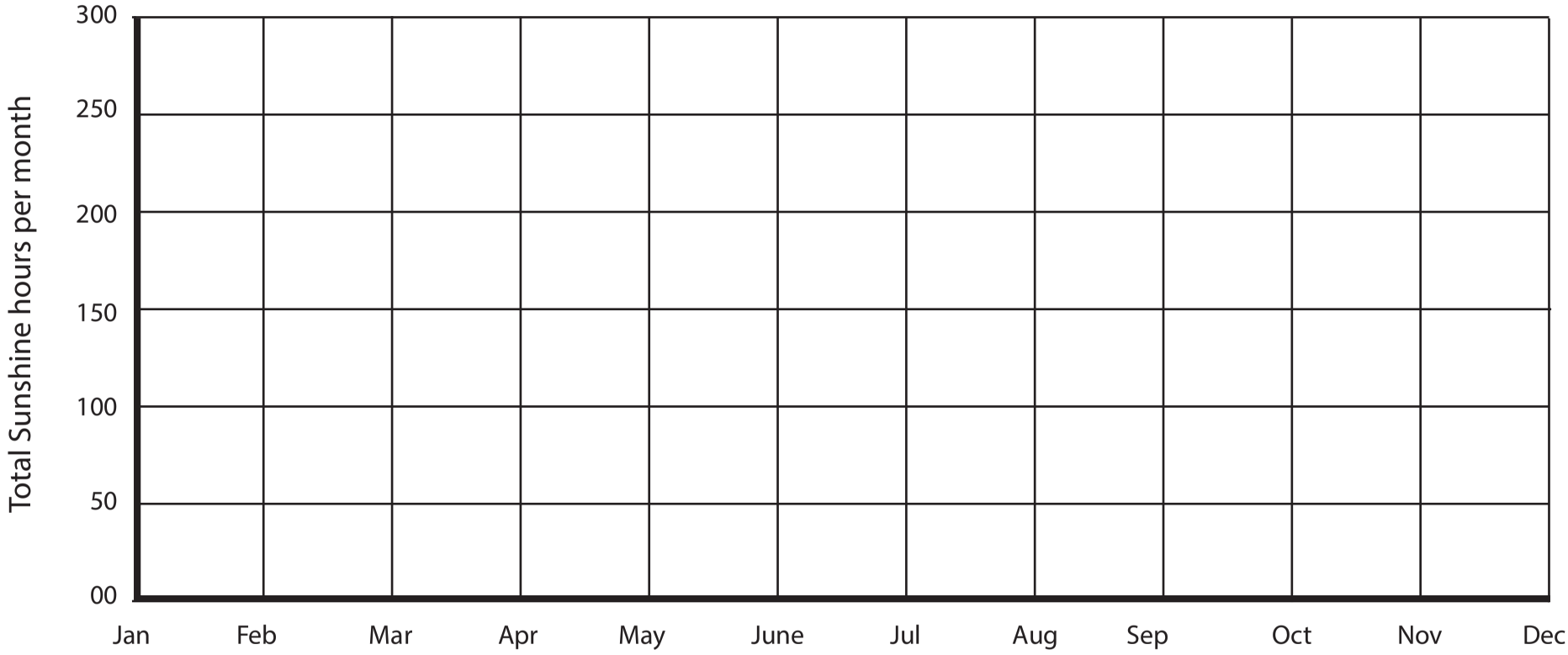
Let's plot the monthly average sunshine hours in South Sudan.
Using the blank line graph below, record the hours on the chart.

Month	Monthly Total
January	280
February	235
March	210
April	200
May	210
June	205
July	185
August	205
September	230
October	240
November	235
December	260
Year	2,690

Let's Talk about what you Learned?

After you record the data, what do you learn from this?

Which month does the Sun shine longest?
Which month does the Sun shine the least?
Why do you think this happens?



Activity 8: Writing a friend about the weather

ALONE OR IN PAIRS

Imagine you are writing to another fourth grade student in the United States. Tell them what you would be seeing, feeling, thinking, and wondering about the weather? Describe whether its hot or rainy. Describe how the weather affects your family, your plants, the animals. Does the weather affect how your family cooks or make a living? Decorate your paper if you like. Have fun with it.

Activity 9: The Water Cycle on Earth

READ ALONE OR ALOUD AS A CLASS

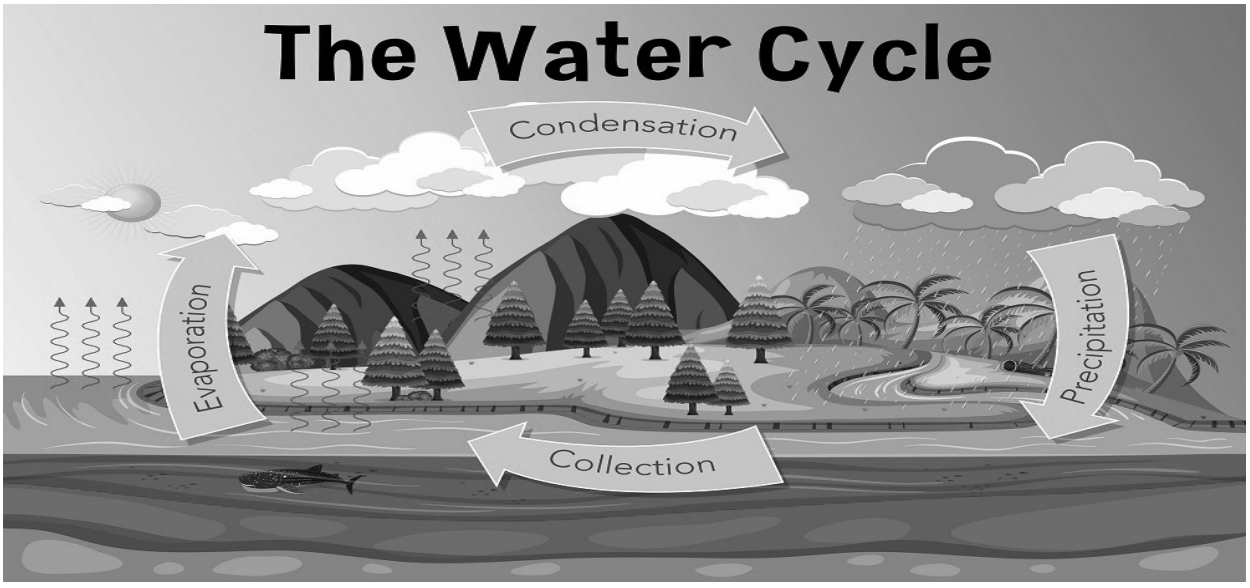
Water is essential for life on Earth.
Water has three states: liquid, solid, and gas.
Water is on the Earth as a **liquid** in our rivers, lakes, and the Sudd, our great wetlands. The Sun heats the water and the water **evaporates** into a gas (or vapor). It raises into the atmosphere.

As the evaporated water raises in the atmosphere, it cools. This is called **condensation**. The condensed, cool water vapor makes clouds.

The water vapor collects in the cloud. It comes down in water droplets called Rain. The rain fills the rivers and lakes. The rain fills the Sudd wetlands. This is called **collection**.

And the water cycle begins all over again.

Importance of the water cycle
The water cycle



Activity 10: Water Cycle Experiment

IN PAIRS AND GROUPS

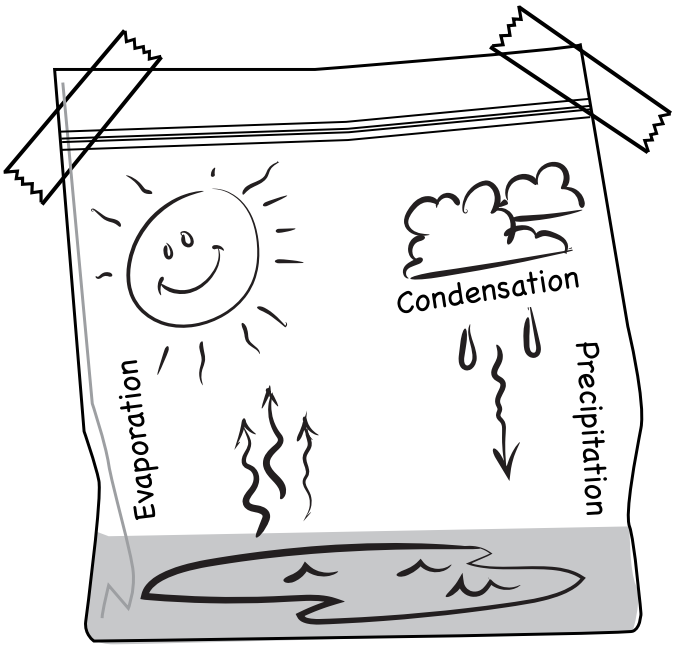
TO BUILD THIS EXPERIMENT, YOU NEED:

1. One plastic zip lock bag.
2. Small cup of water
3. Tape

DIRECTIONS

1. Pour about an inch of water into the plastic baggie.
2. Tightly seal the plastic baggie.
3. Put tape the corners of the baggie to a window in a sunny area. If you don't have a window, place the plastic bag in the sun.
4. When the sun's energy hits the water in the bag, it will cause the liquid to heat up. Slowly, the water will turn into a gas stage and rise up inside the bag. This process is called **evaporation**.
5. The water gas, or water vapor, will try to escape the bag, but there is no where for the water vapor to get out. Slowly, there is nothing else the water can do - but turn back into a liquid stage. This is called **condensation**. The water droplets fall back down to the bottom of the bag. This process is called **precipitation**.

If you have markers, draw words and pictures like these on your baggie.



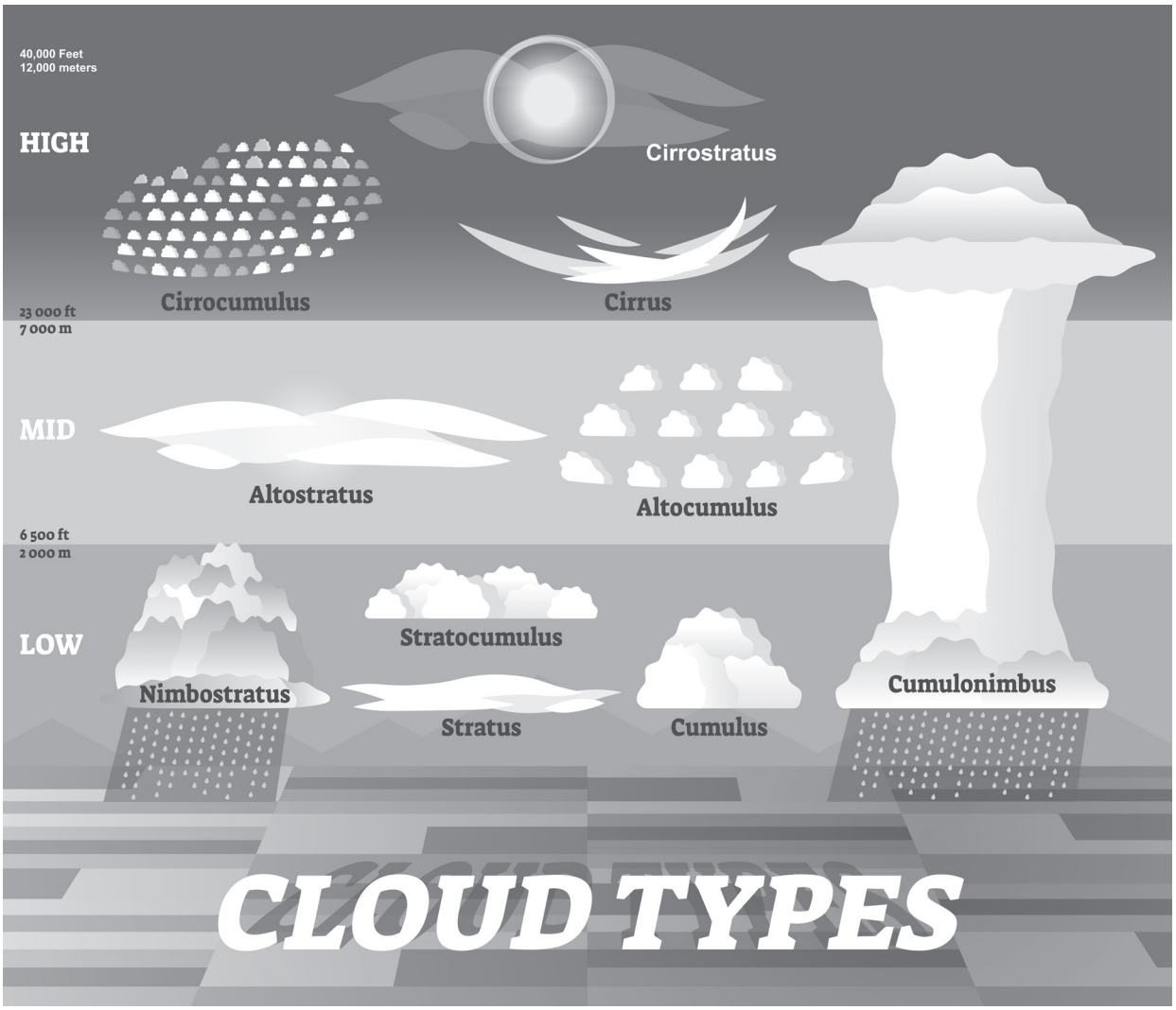
Activity 11:
Study the Clouds

IN PAIRS AND GROUPS

Clouds are the water vapor floating in the sky. When the sun heats the earth's water, the water evaporates and rises into the sky.

Importance of Clouds
Clouds give us shade from the Sun.
Clouds bring the rain that waters our gardens.

There are different types of clouds. What kind of clouds are in the sky today? Can you point to them on this chart?



Activity 12: Record Cloud Coverage

IN PAIRS AND GROUPS

Draw the type of clouds you see for the next week

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Activity 13: Temperature

READ ALONE OR ALOUD IN CLASS

Temperature is how hot or cold something is. The air can be hot, cold, or warm. A thermometer is an instrument used to measure the temperature.

The sun heats the ground and the air. This causes the air to get warm and the temperature to rise.

In the Summer, the temperatures can get very high in South Sudan. When the temperature gets too high, there are heat-waves. This is not good for humans, animals, or our crops.

The high temperatures make the surface water evaporate faster. It makes the soil dry. Our crops need water to grow. The water level in our wetlands goes down. This is hard on the animals and the fish.

According to the *Climate Change Vulnerability Index 2017,* South Sudan is ranked among the world's five most vulnerable countries and is experiencing some of the most acute temperature changes.

Weather Word Search

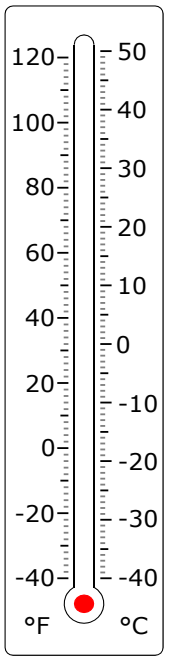
E X J J G N K K R S G X G L O E N Z K X
V C J T J J Y Y F V T C N S A C U K G N
A L P W X K Y C D K H N G N S L M H X N
P D R Y S A W O T E E H E R N I E E V T
O O G F G Q Y U C B R O J M T M T A D E
R Z A T V A R Z Z R M T M S P A E T R M
A M S T L U W G O S O A I W V T O W B P
T Y H C M R D B X J M X G Y D E R A F E
I A C F C O I C F Z E J R S R C O V F R
O Q E Z S A S F V G T C A T O H L E T A
N G L L X L I P H V E W T A U A O N R T
E L S F E T A U H M R K I K G N G U X U
R Q I B X P I X K E L Y O R H G I I P R
X C U N N H O E K S R A N L T E S P B E
E U S F J S B D Z E O E D L A O T P H D

climate change
evaporation
drought
Temperature
atmosphere
dry
meteorologist
heatwave
celsius
Thermometer
migration
hot

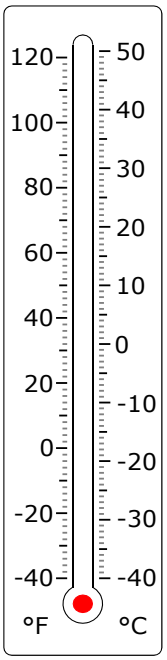
Activity 14: Measuring temperature

IN PAIRS AND GROUPS

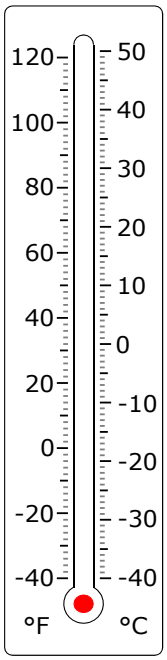
A thermometer is a device used to measure temperature. It measues the temperature in divisons called degrees. Using the thermometers below, shade in the correct temperature on each thermometer.

1. 

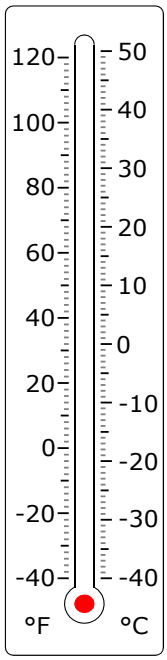
-19 °C

2. 

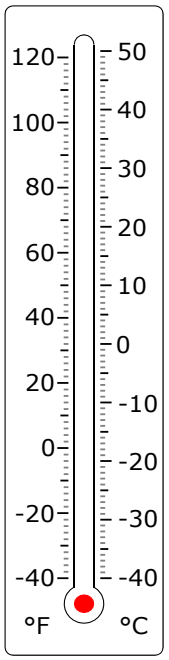
10 °C

3. 

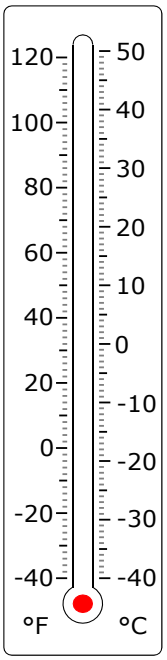
2 °C

4. 

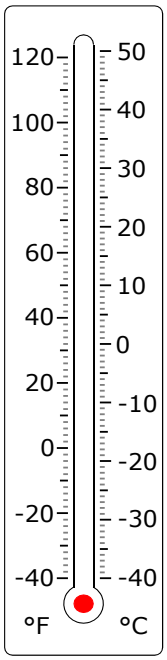
-2 °C

5. 

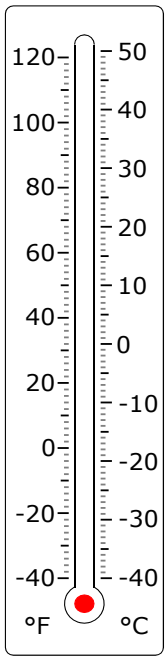
-26 °C

6. 

12 °C

7. 

-13 °C

8. 

9 °C

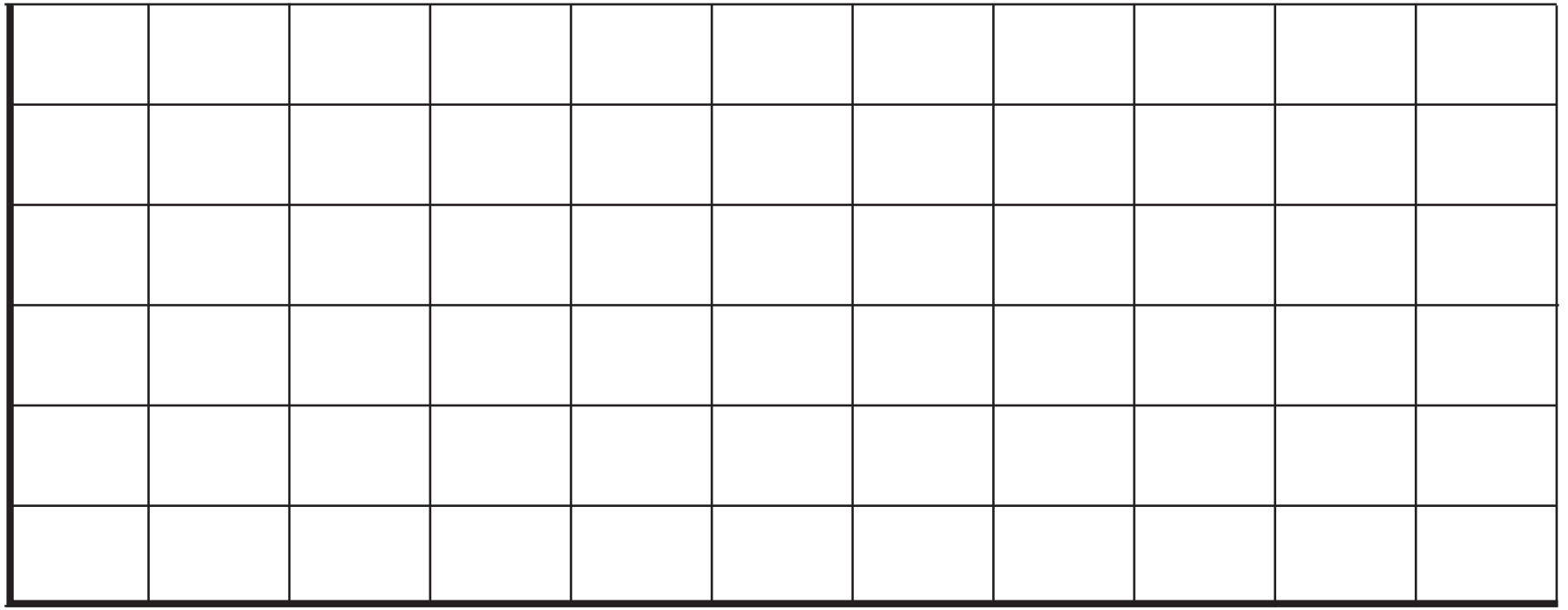
Activity 15: chart the temperature

IN PAIRS AND GROUPS

Below are the average monthly temperatures for South Sudan.
Using a line graph below, plot these temperatures on the line graph.

What is the hottest month?
What is the coldest month?

Average temperatures in Juba (ºC)		
Month	Low Temp	High Temp
January	20	37
February	22	38
March	24	38
April	23	35
May	23	34
June	22	32
July	21	31
August	21	32
September	21	33
October	21	34
November	21	35
December	20	36
Year	21.6	2,690



Activity 16: Rainfall

READ ALONE OR IN PAIRS

Rain is the liquid form of water that falls as droplets from the clouds in the sky.

South Sudan receives most of its rain in the 'long-rain' season between June and September, during which relatively heavy and steady rains are usually common.

Rain restores the ground water. It helps our crops to grow. Rain fills the small streams that fill the ponds, lakes, and marshes that flow into the White Nile. The Rain fills the Sudd, the great wetlands of South Sudan.

Rain: too much or too little is not good.

Too much rain can cause floods. A flood is a large amount of water that overflow from a river or lake. A flood can destroy our homes and animal habitats. Flood can destroy roads and bridges.

Too much rain can cause soil erosion. Erosion is the washing away of the top soil and can cause landslides. A landslide is a sudden fall of a mass of earth and rock down the side of a mountain. Landslides destroy crops. Landslides can kill animals and humans. Landslides cause soil erosion.

Too much rain makes the roads impassable. Vehicles get stuck.

IN PAIRS AND GROUPS

Talk with a friend. What do you do when it rains?

Between December and February, it almost never rains in South Sudan. Many wild animals migrate in search of water and green grass.

Activity 17: Make a Rain Gauge

IN PAIRS AND GROUPS

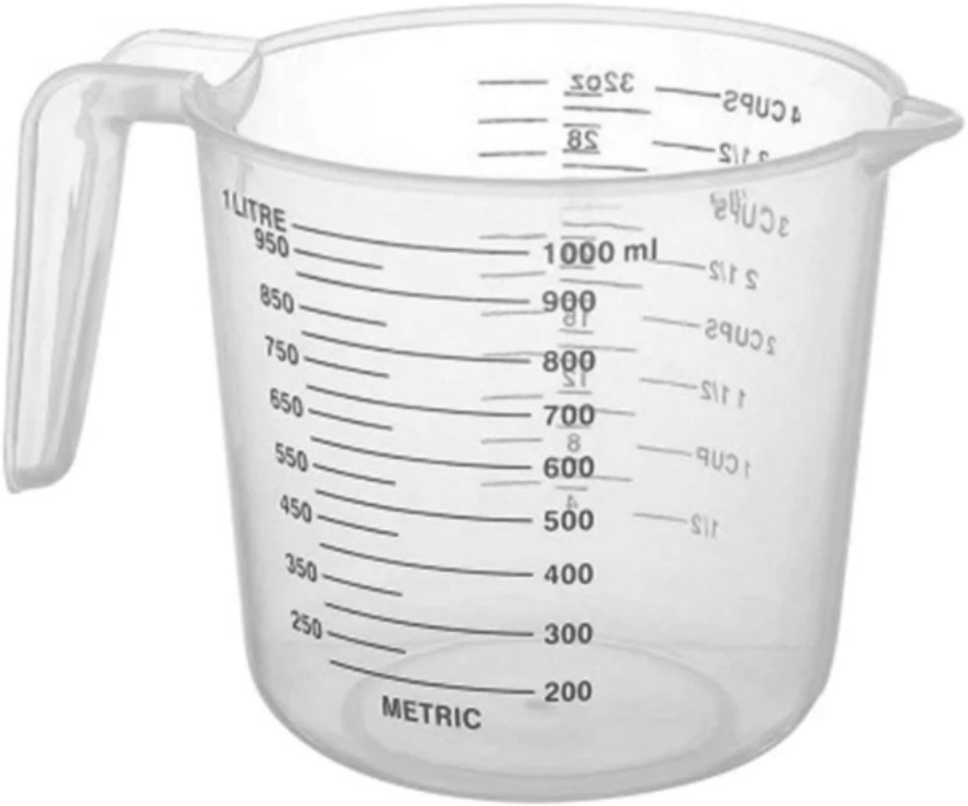
A rain gauge is basically a container that collects rain water. The best rain gauge has a flat bottom to make recording of rainfall more accurately.

A measuring cup works well as a rain gauge. It has markings on the side to help with measuring. You just need to place the measuring cup in an open area. Need to put some rocks, or other materials, around it to keep it from blowing away.

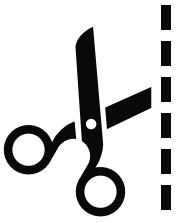
If you use a measuring cup, it will have measuring lines on it already.

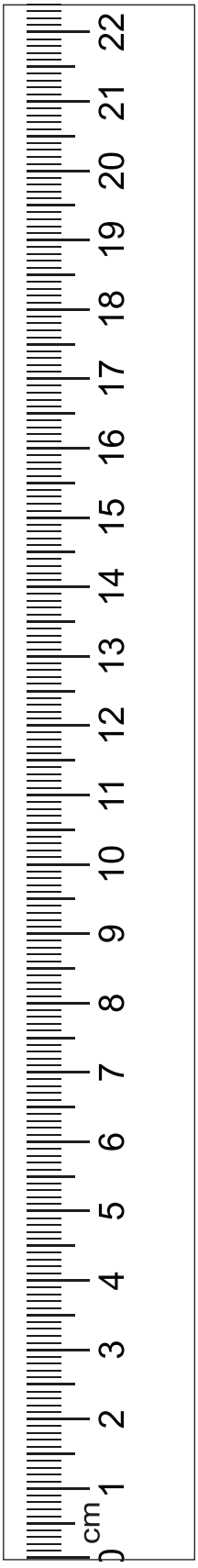
Rain Gauge measuring ruler

Your rain gauge needs a wide mouth



Your rain gauge needs a flat bottom

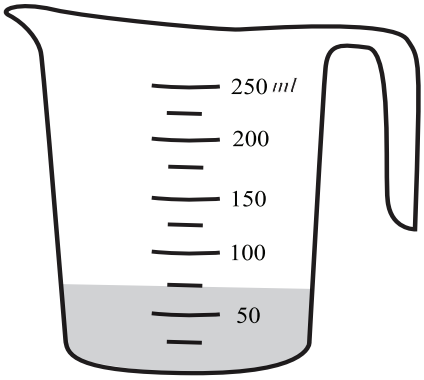




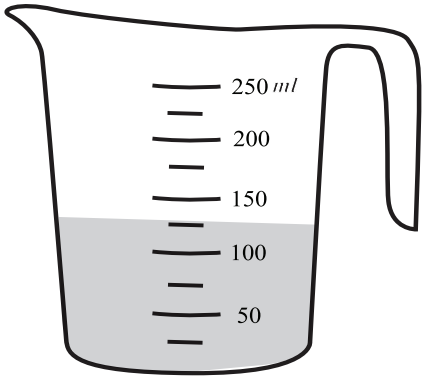
Activity 18: How is rainfall measured?

IN PAIRS AND GROUPS

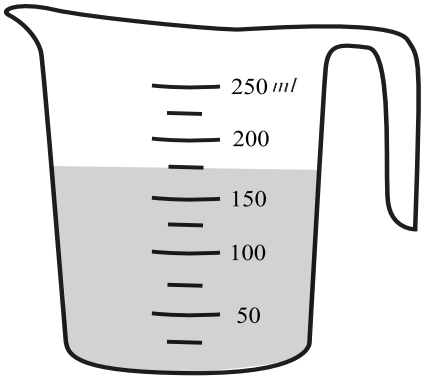
A rain gauge measures how much rain has fallen from the clouds. It catches the rain that falls into this measuring cup. The cup is marked by millimeters to show how much rain has fallen. Work with a partner to answer these questions below.



How much rain is in this cup?

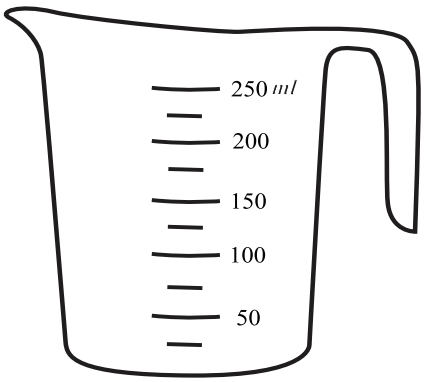


How much rain is in this cup?

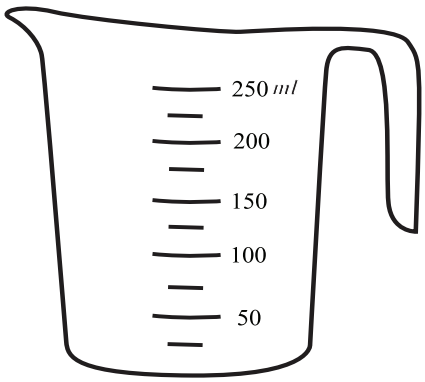


How much rain is in this cup?

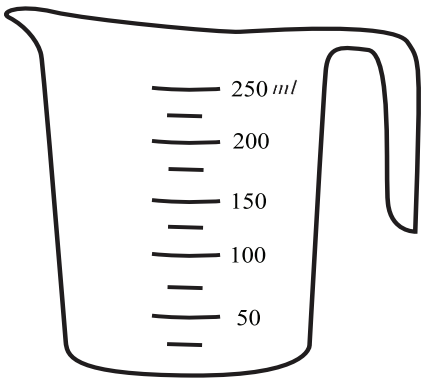
Use a crayon or pencil to color the right amount of rain fallen.



10 mm



50mm



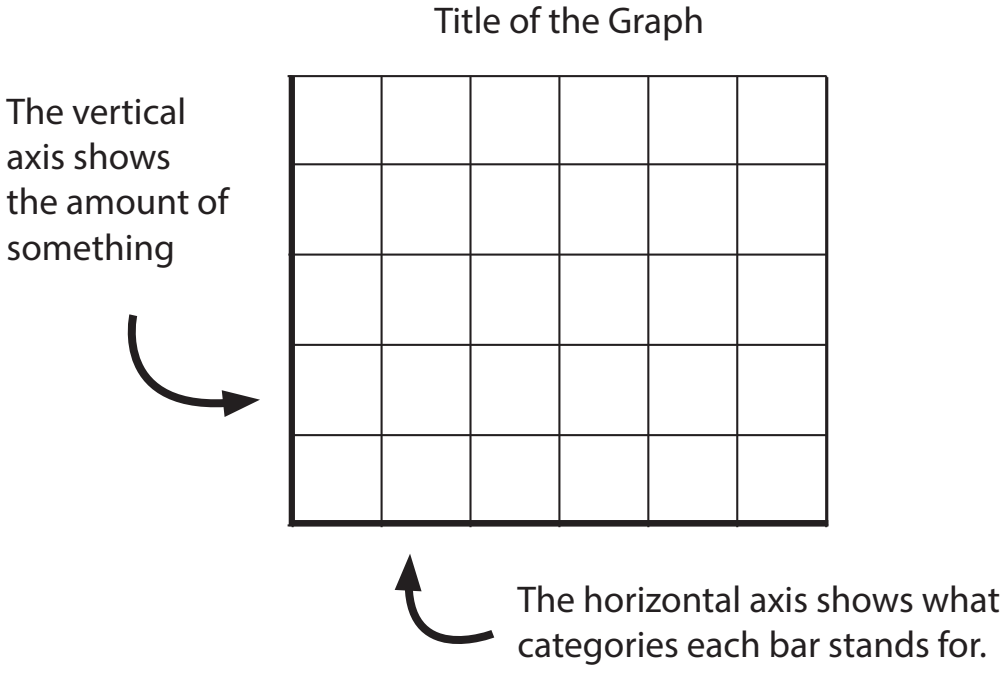
25mm

Activity 19: Learn to read a Bar Graph

IN PAIRS AND GROUPS

A bar graph is a chart that plots data using rectangular bars (called bins). A bar chart is used to compare changes over time.

Work with a partner to learn how to read a bar graph.

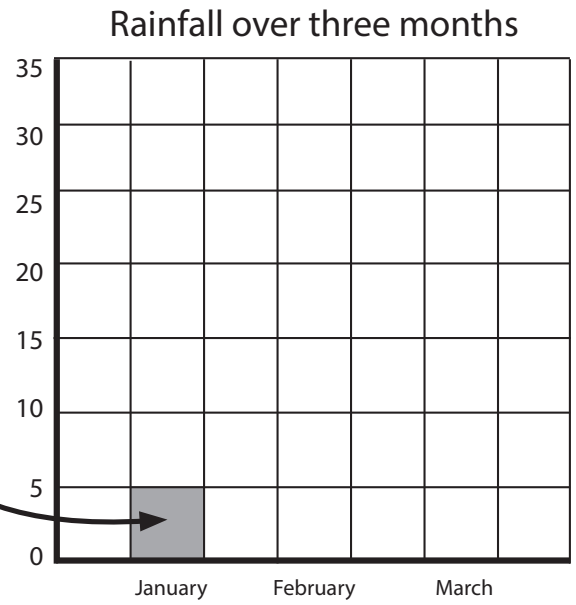


Next, you look at your information you want to put on the graph. This is called "plotting the data".

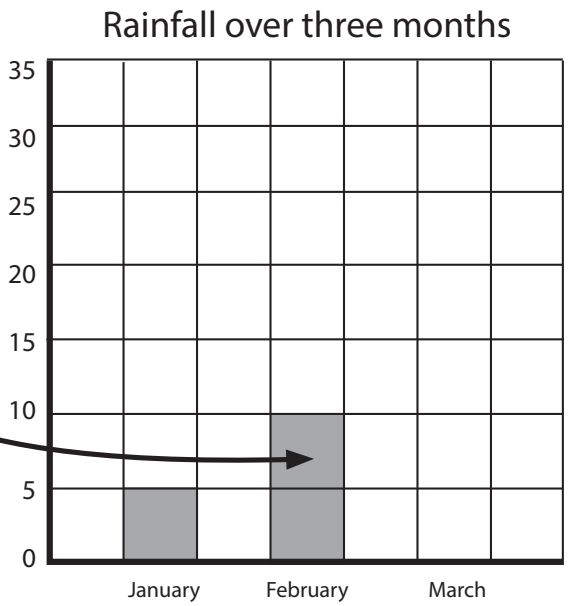
For our example, we want to plot the first three months of rainfall in South Sudan.

- January had five (5) millimeters of rain
- February had ten (10) millimeters of rain
- March had 35 millimeters of rain.

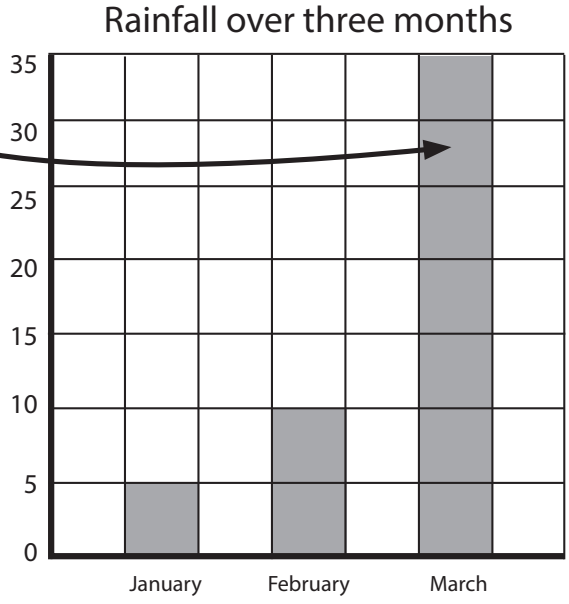
January had five millimeters of rainfall.



February had ten millimeters of rainfall.

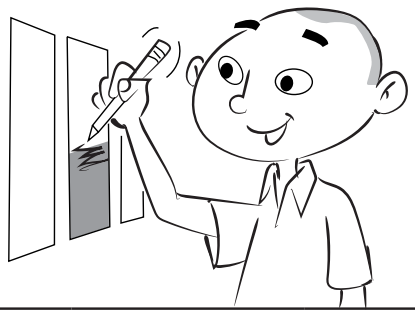


March had over 35 millimeters of rainfall.



Activity 20: Chart annual rainfall

IN PAIRS AND GROUPS



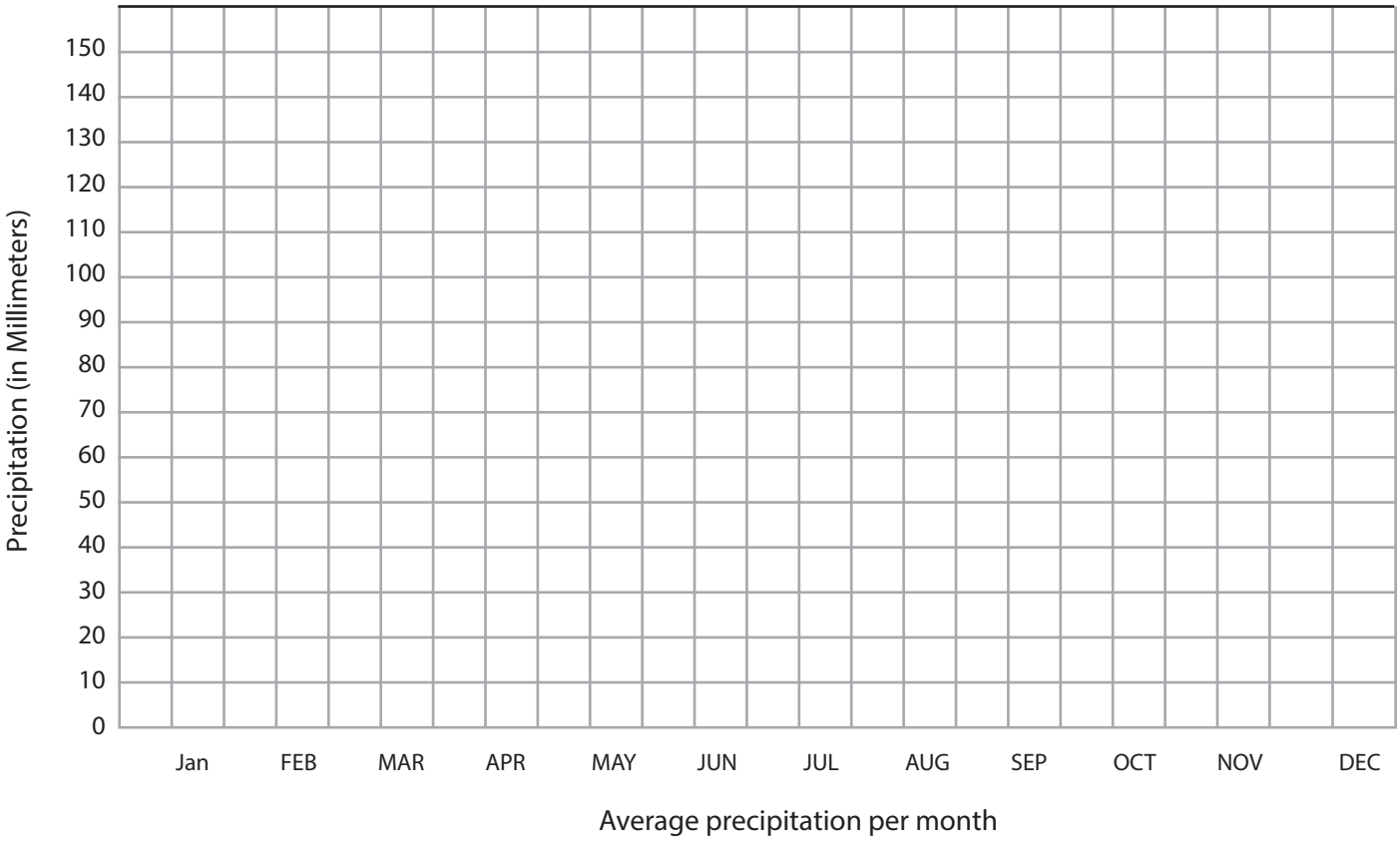
Let's look at how much rain falls on Juba, the capital, over a year's time.

Using the information (data) with the rainfall per month, chart this on the **bar graph** below.

Which month is the wettest?
Which month is the driest?

Average precipitation in Juba (mm)		
Month	Millimeters (mm)	Days
January	5	1
February	10	2
March	35	7
April	110	12
May	130	12
June	120	10
July	145	13
August	130	12
September	105	9
October	114	10
November	2145	7
December	10	2
Year	955	96

Average Annual Precipitation (Rain Fall) in Juba



Activity 21: The Wind

IN PAIRS

Wind is moving air. We can't see the wind, but we can see it move things. Sometimes, we can hear it and feel it.

What can wind go? Fill in the blanks from your own experience.

Wind can blow a _____

Wind can fly a _____

Wind can knock down a _____

Wind can make a _____ go faster.

I can hear the wind when _____.

I can feel the wind when _____.

Draw a picture of a windy day. Show wind at work!

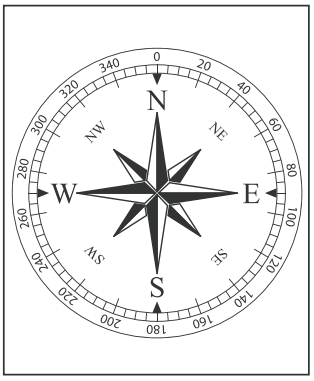
Activity 22: Make a simple wind vane

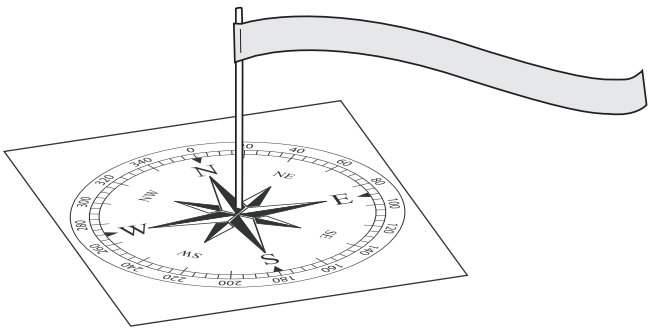
IN PAIRS AND GROUPS

A simple weather vane can be used to determine wind direction and measure wind speed. There are different ways to make a simple weather vane.

Follow these steps to build a simple weather vane:

1. Make a compass rose on a paper plate with the ruler and maker. (or use the inside back cover of this workbook, there is a compass rose.)
2. Find a straight stick or piece of wood
3. Poke a hole into the center of the plate with a sharp pencil or stick
4. Find a thin, long strip of paper or plastic. You want the strip to move with the wind.
5. Secure the paper (or thin plastic) streamer to one end of the stick and poke the other end of the stick into the hole in the center of your plate. Secure the stick with the paper plate.
6. Your wind vane should look like this:





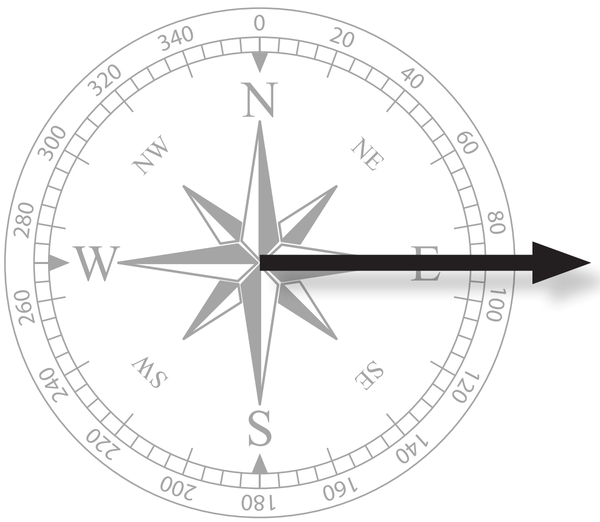
7. Place your wind vane on the ground where the wind can be felt. Find a way to secure your wind vane, so it doesn't blow away.
8. Turn your compass rose so that the North arrow faces North
9. Observe the streamer. Which way is the wind blowing from?

Activity 23: Practice measuring the wind direction

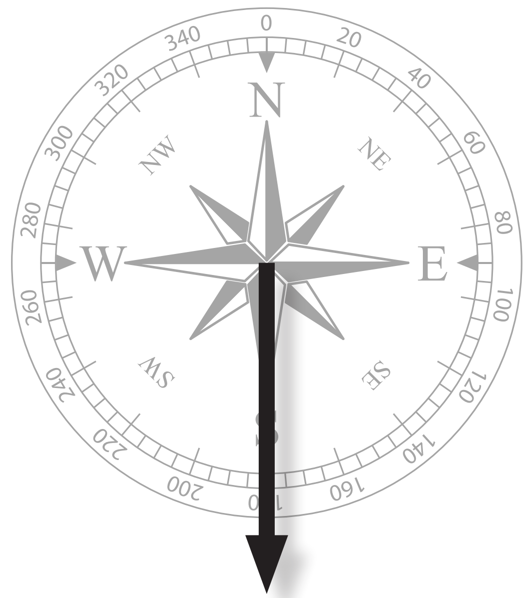
IN PAIRS AND GROUPS

In order to record wind direction, let's practice our compass directions of North, South, East, and West.

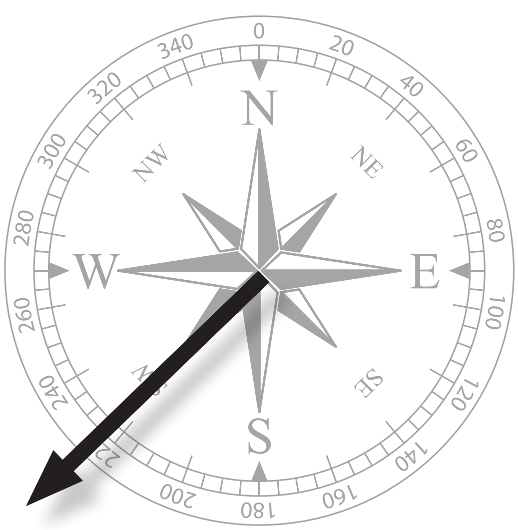
Work with a partner to draw in the wind's direction.



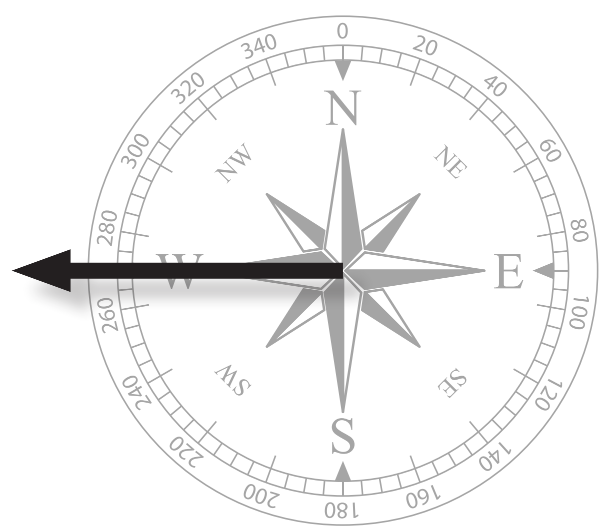
Which direction is the wind blowing?



Which direction is the wind blowing?



Which direction is the wind blowing?



Which direction is the wind blowing?

Activity 24: Practice measuring the wind speed

IN PAIRS OR GROUPS

With a partner, go outside and observe the wind. Then, look at this chart and determine the approximate wind speed.

What is the wind direction today?
What is the wind speed today?

OBSERVATION OF WIND	APPROXIMATE WIND SPEED (kilometers per hour)
Smoke rises vertically	0
Smoke drifts, so you can see direction of wind	2 – 5
Wind felt on face, Leaves rustle	6 – 12
Leaves, small twigs in constant motion	13 – 20
Dust and leaves blow around, tree branches move	21 – 30
Small trees begin to sway	31 – 40
Large branches of trees in motion	41 – 50

Activity 25: Build your own Weather Station

AS A CLASS

Meteorology is the study of all changes in the atmosphere.

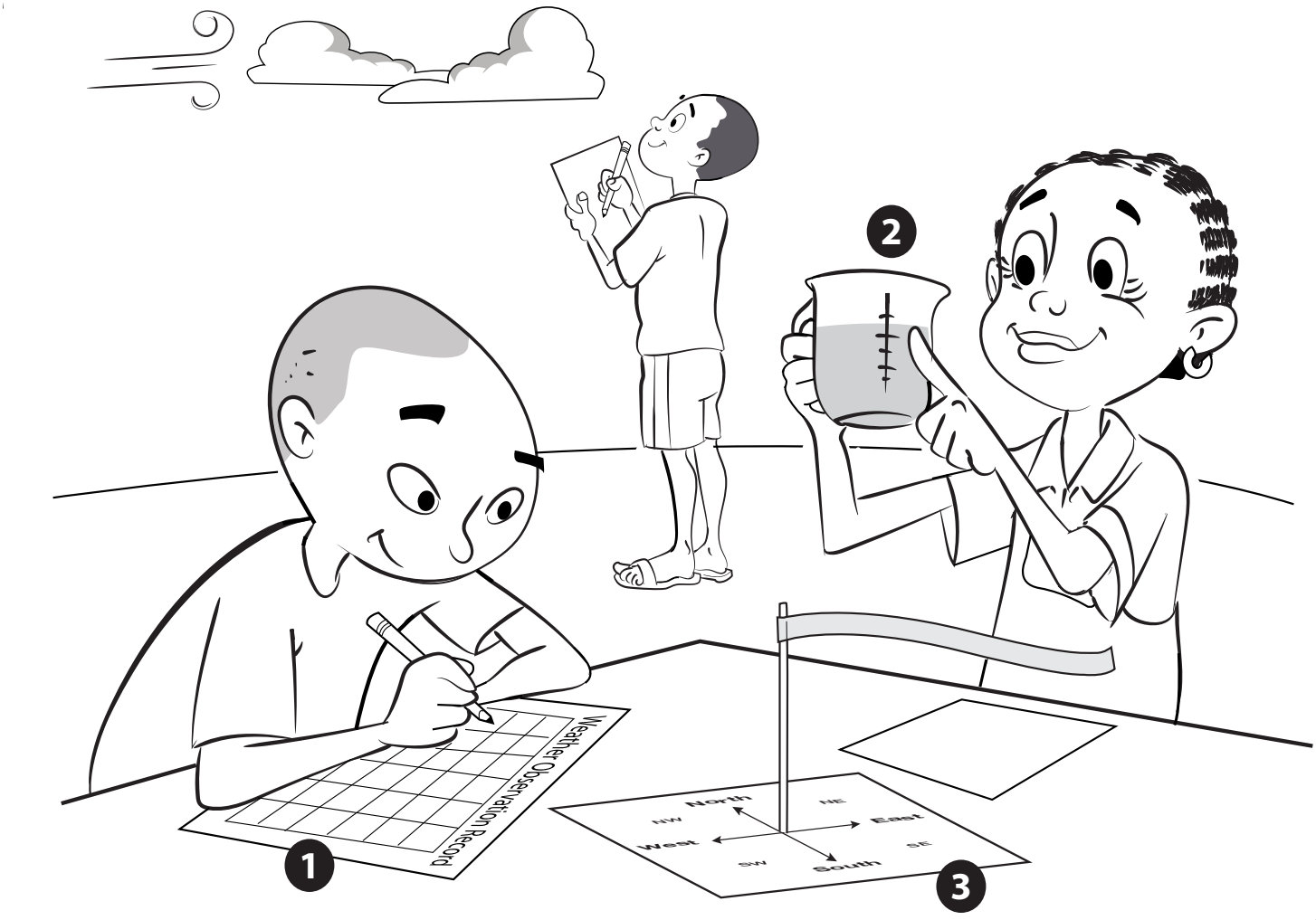
To do this, you must first make your own weather station to record weather data.

Instruments in your weather station:

1. a weather observation record sheet
2. a rain gauge
3. a weather vane

On the next page is your weather observation record sheet for one week. Use this sheet to record your weather findings.

You are now a meteorologist!



Activity 26

Weather Observation Record

	MONDAY Date _____	TUESDAY Date _____	WEDNESDAY Date _____	THURSDAY Date _____	FRIDAY Date _____	SATURDAY Date _____	SUNDAY Date _____
Wind Speed							
Wind Direction							
Precipitation							
Temperature							
Cloud Coverage							

Activity 27: How does Weather affect us?

IN PAIRS AND GROUPS

Weather affects our lives in different ways. Work with a friend and talk about different ideas of the positive and negative impacts of weather.

	Positive Impacts	Negative Impacts
Our health		
Farming		
The forests		
The Wetlands (The Sudd)		
Shopping		
Playing Outside		
Water to drink		
Living in Tents		
The Wild Animals		

Activity 28:
Deforestation and climate change

READ ALONE OR READ ALOUD IN CLASS

South Sudan is losing trees. Thirty-five percent of the country's land was once covered with trees, and only 11 percent is now, according to the Ministry of Environment and Agriculture. The cutting down of trees on a large scale is called **deforestation**.

Roughly 99% of the South Sudan's population depends on forests as their source of fuel-wood and charcoal and timber for construction and furniture.

The wooded mountains are considered the "water towers" for the country. The trees allow the rain to be absorbed slowly into the ground. If there are less trees, the rain is not slowly absorbed into the ground, but quickly flows down the mountain side. This can create floods.

Dangers of Floods
The flood waters flood village homes. It destroys crops. The flood water can become contaminated with pollution, chemical waste, sewage. Water may be unsafe to drink. The flood water can wash away soil.

Then, when the rains stop, the ground has not had enough time to absorb the water and it quickly dries, creating a drought. This leads to **desertification**. The lack of trees is directly contributing to the rise in temperatures and to South Sudan's climate change. Trees are a way of controlling floods in South Sudan.

ALONE OR IN PAIRS

Answer these Weather Word Problems:

1. 35 percent of South Sudan was once covered by trees. Now only 11 percent is covered by trees. What percent of the land is no longer tree covered?

2. 14 trees were cut down on Monday, 25 trees on Tuesday, and 34 trees on Wednesday. How many trees were cut down in total?

3. There are 25 rows of 18 newly planted trees. What is the total number of trees planted?

Activity 29:
Can Climate change be limited?

READ ALONE OR READ ALOUD IN CLASS

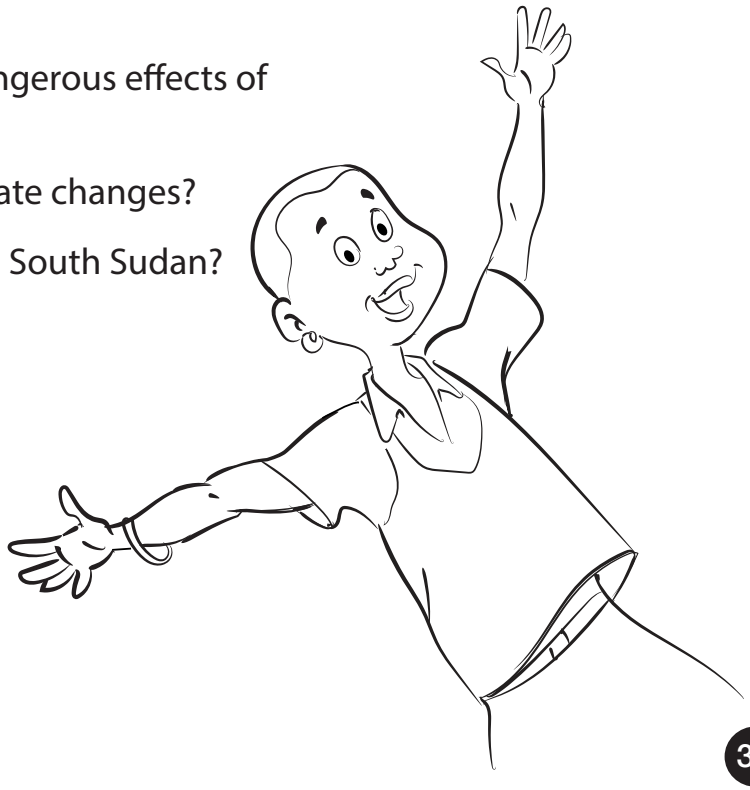
How can we help limit climate changes in South Sudan?
What are suggested solutions to help stop climate changes in South Sudan?

1. Our farmers need seeds that are strong against flooding and drought.
2. We need to plant millions of trees over the next ten years.
3. We need to promote wetland management to help control flooding.
4. Diversify livelihoods away from subsistence farming.
5. Use renewable energy. Using hydro-power projects and wind turbines.

IN PAIRS AND GROUPS

Express your thoughts. Make a poster. Show others your idea. Use the blank page on the opposite side. Choose one of these ideas:

1. What do you consider to be the most dangerous effects of climate change?
2. What is your suggested solutions to climate changes?
3. Why is the study of weather important in South Sudan?



My Poster on Climate Change