THE REPUBLIC OF UGANDA
Ministry of Education and Sports

PRIMARY SEVEN
SELF STUDY MATERIALS

NCDC
NATIONAL CURRICULUM DEVELOPMENT CENTRE

ENGLISH LANGUAGE

Lesson 1: Conversation

Learning Outcomes

By the end of this lesson, you should be able to:

i) read the texts about holidays.
ii) answer well questions about the text on holidays.
iii) write the answers in full sentences.

You will need:

- a pen or pencil
- an exercise book

Introduction

Conversation is a talk between two or more people.

Activity

Read the conversation below and answer the questions about it in full sentences.

MARIA: Excuse me. Could you direct me to the post office, please?

GLORIA: Certainly. Go straight along this road then turn left and you will see the building on your right. That is the post office.
MARIA: Thank you very much.
GLORIA: You are welcome. Where are you from?
MARIA: I am from Poland.
GLORIA: Are you on holiday in Kenya?
MARIA: Yes, I am. I am staying in Nairobi for four days and I will visit Tsavo National Park.
GLORIA: Are you enjoying yourself here?
MARIA: Oh, yes! Very much. Everybody I come across is good and welcoming.
GLORIA: Everything here must be much different from Poland. Are you enjoying the meals?
MARIA: Yes, they are delicious. I love the fish. We eat lots of fish in Poland although we have different types.
GLORIA: Well, I wish you a wonderful stay in Kenya.
MARIA: Thank you very much.

Questions

1. How many people are talking in the conversation?
   _____
   _____
2. Did Maria know where the post office was?
   _____
   _____
3. From which country did Maria come?
   _____
   _____
4. For how long is Maria staying in Nairobi?
   _____
   _____
5. Which place is Maria going to visit after Nairobi?
   _____
   _____
6. What food is basically eaten in Poland?
   _____
   _____
7. What did Maria want Gloria to do for her?
   _____
   _____
8. Why did Maria come to Kenya?
   _____
   _____
9. Give the meaning of the following word or group of words bolded in the conversation.
   (a) come across _____
   _____
   (b) delicious _____
   _____

Lesson 2: Direct Speech

Learning Outcome

By the end of this lesson, you will be able to construct sentences using direct speech.

You will need:

- a pen/pencil
- an exercise book

Introduction

A direct speech is the reporting of a speech by repeating the actual words of a speaker. The actual words are put between inverted commas.

From the examples below, observe the punctuation marks in the direct speech.

1. He said, “I am a Ugandan boy.”
2. They say, “The sun rises from the East.”
3. My father asked, “Where was Peter yesterday?”
4. “The milk has gone bad,” said John.
5. “Nobert,” said Donah, “is a liar.”
6. “All latecomers, lie down!” shouted the teacher on duty.

Activity 1

Write down six sentences in direct speech.

Lesson 3: If (3) Conditional

Learning Outcomes

By the end of this lesson, you should be able to construct sentences using **If (3)** in the present simple tense.

You will need:

- an exercise book
- a pen/a pencil

Introduction

We use **If (3)** when we are imagining something that would have happened if a certain condition had been in place.

Step 1: Construct 2 sentences in the present perfect tense

Example

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i) Jumanyol has visited his relatives in Busia.
ii) Jumanyol has finished his remedial lesson.

Step 2: What happens when you join sentences (i) and (ii)

When Jumanyol visited his relatives in Busia, he had finished his remedial lesson.

The past perfect is formed when you join sentences (i) and (ii)

Step 3: If (3) is formed by using the **past perfect tense** in the **if-clause** and a **would have** with a participle in the **main clause.**

Read the following sentences

1. If Owino had fetched water, he would have washed his clothes.
2. If Muhwezi had visited his uncle, he would have met his cousins.
3. Okabo would have ridden his bicycle if he had repaired it.
4. If Sandra had rung us, she would have got the information about my birthday.

Step 4: Which is the 'if-clause' in the sentences above?

1. If Owino had fetched water **(if-clause)**, he would have washed his clothes.
2. If Muhwezi had visited his uncle **(if-clause)**, he would have met his cousins.
3. Okabo would have ridden his bicycle, if he had repaired it **(if-clause)**.

Step 5: Which is the **main clause** in the sentences above?

1. If Owino had fetched water**,** he would have washed his clothes (**main clause**).
2. If Muhwezi had visited his uncle, he would have met his cousins (**main**
3. **clause**).
4. Kabo would have ridden his bicycle **(main clause)** if he had repaired it.
5. If Sandra had rung us, she would have got the information about my birth day **(main clause)**.

Step 4: Make sentences from the table below.

Example

1. **If** Mudondo had visited Kisoro, she would have seen the game park.

A	B
1. If Diana had played ,	we would have held a debate.
2. If Akello had visited Kisoro,	we would have milked the cows.
3. If you had fetched water,	you will miss the bus.
4. If you don't wake up early,	our team would have won the match.
5. If the schools had not closed due to COVID-19,	you would have gone with us.
6. If we had gone to the farm,	she would have seen the game park.

Exercise

Complete the following sentences correctly.

Examples

i) If Gabeya had visited us before COVID-19 outbreak,.....

If Gabeya had visited us before the COVID-19 outbreak, she would have used a taxi.

ii) The police would not have arrested them.....

The police would not have arrested them **if they had arrived before the curfew time.**

1. If I had gone to Gulu,..... .....
2. She would have visited us if..... .....
3. Bucu would have made for us a kite if. .....
4. If he had bought sanitizer
5. If they had asked us,..... .....

Lesson 4: Composition

Learning Outcome

By the end of this lesson, you should be able to write a composition about the holiday you never enjoyed.

You will need:

- an exercise book
- a pen/a pencil
- a free book

Introduction

If you are to write a good composition you will need to be able to imagine. Tell yourself the story silently before you write the composition.

Step 1: The following words have been written wrongly. Write them correctly.

stenp cleap yilhoad

Step 2: Read the story below

Life in the Village

Though she liked the two days she stayed with her grandfather, Victoria complained that life in the village was hard. Back at home in Gulu, she told her mother, "We had supper at nine and didn't go to bed until eleven o'clock. For an hour or two we could not sleep at all. Hundreds and hundreds of mosquitoes kept buzzing in our ears and they bit us." She continued, "You know Mummy, I am interested in flowers. I collected not only flowers but also weeds. Grandfather, however, did not approve of the idea of mixing weeds with flowers. He thinks weeds are useless. I tried to make him change his mind but he refused to listen. He was interested in playing musical instruments .Every evening he played a drum, and we each tried to play it. I found it a difficult instrument to play."

"Couldn't you go to the nearest trading centre?" asked Victoria's mother. "How many times a day does the bus to Koch Goma run?"

"There is only one bus," answered Victoria, "and it doesn't leave for Koch Goma until ten o'clock in the morning. Once on our way back, it could not climb the hill until we decided to get off and let it climb without us. I am very glad to be back home in town again."

Questions about the story

1. What did Victoria complain about?
2. At what time did Victoria go to sleep while in the village?
3. Why didn't Victoria's grandfather approve of mixing weeds with flowers?
4. What was Victoria's grandfather interested in?
5. Where did Victoria and her parents live?

Exercise

Write a composition of 100 words about the holiday you never enjoyed.

In your composition include:

- The place where you had your holiday.
- Why you had holidays in that

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place.
- Whom you spent the holidays with.
- What you did in the holidays.
- Why you didn't enjoy the holidays.

Note:

In your composition, remember to include the title and paragraphs.

You may use the following tips:

Step 1: Choose the title of the composition you are going to write.

Step 2: List the words to be used while writing the composition (on a draft page).

Step 3: Pair up the words that you will use while writing sentences.

Step 4: Write the sentences in their correct order.

Step 5: Write the final composition in your exercise book. Begin each sentence with a capital letter.

Use commas, full stops, and other punctuation marks well.

Step 6: You should proofread to correct the misspellings and misuse of words.

Read your composition to others.

(HEALTH TIP: Observe social distancing, stay home and stay safe!)

Lesson 5: Letter Writing

Learning Outcomes

By the end of this lesson, you should be able learn to:

i) identify the components of a formal letter.
ii) know when formal letters are written.
iii) write a formal letter.

You will need:

- a book/sheets of paper/a notebook
- a pen
- a pencil

Introduction

A letter is a message that is written down or printed on paper. It is usually put in an envelope and sent to somebody.

A formal letter is written for the following reasons:

- Applying for jobs
- Applying for study vacancies
- When making inquiries
- Apologizing for offences
- Invitations

Activity I
Read the formal letter below and answer the questions about it in full sentences.

Muchwa Primary School,
P. O. Box 1994,
Ntungamo.
6th March, 2020.

The Debate Coordinator,
Nyange Primary School,
P. O. Box 80,
Masaka.

Dear Sir/Madam,

Re: <u>Invitation for A Friendly Debate</u>

I am writing to invite your school to have a friendly debate with ours.
The motion of the debate will be "Day Schools Are Better than Boarding Schools". It will take place on 11th March 2020, and will start at 2.00 pm. It will last one and a half hours, so try to keep time.

Please inform your pupils to decide whether they will be proposers or opposers. Kindly let me know the side you have taken as soon as possible.

I am looking forward to hearing from you soon.

Yours faithfully,
Nsamba Charles
NSAMBA CHARLES

(Chairperson Debate Club)

Questions

a) When was this letter written?
b) Who was it written to?
c) Mention the motion for this debate.
d) At what time will the debate end?
e) Why did Nsamba Charles write this letter?
f) How is Nsamba Charles important in his school?

Activity 2

Imagine that an announcement has been made giving the dates when schools are set to reopen after the national lockdown which was due to Coronavirus. Unfortunately, you are not sure when your school will be reopening.

Write a letter to your head teacher asking him/her the date when your school will reopen.

In your letter, inform him/her that you are safe, healthy and ready to continue with your studies. Use your school address.

(HEALTH TIP: Sanitise or wash your hands frequently with clean water and soap to stay safe.)

LESSON 6: Preparation for Examinations

Learning Outcomes

By the end of this lesson, you should be able to:

i) use language appropriate in preparation for examination.
ii) construct sentences using '**. . . or else . . .**'

You may need:

- an exercise book
- a pen/pencil

Introduction

Mention two things which are supposed to be done during this period of quarantine.

Example: Staying at home.

Then mention what will happen if you do not stay at home.

Example: You may contract coronavirus.

Now write a sentence about what is supposed to be done, including the danger if it is not done.

Example

i) Revise your notes, or else you will fail your examinations.
ii) You must revise your notes, or else you will fail your examinations.
iii) You had better revise your notes, or else you will fail your examinations.

Activity
Join sentences in column A with those in column B, using 'or else'.

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A	B
1. Study the timetable	you will not know when the examinations begin.
2. You must follow the instructions	your paper will not be marked.
3. You had better pay registration fees	you will not be allowed to write examinations.
4. Enter the examination room early	you will miss the examinations.
5. Candidates must write their names on examination papers	their results will not be returned.

Follow-up Activity

Rewrite the following sentences using '**. . . or else . . .**'

1. If you don't wash your hands, you will catch diseases.
2. You will not get what you want unless you speak politely.
3. The cows will not produce enough milk if you don't feed them well.
4. Wash your clothes if you don't want to look like the odd man out.
5. Sharpen your pencil if you want it to draw nice pictures.

(HEALTH TIP: Sanitize or wash your hands frequently with clean water and soap to stay safe.)

LESSON 7: Preparation for Examinations

Learning Outcomes

By the end of this lesson, you should be able to:

i) use language appropriate to preparation for examination.
ii) read and comprehend texts related to preparation for examinations.

You will need:

- examination timetables
- a pen
- an exercise book or notebook

Read the conversation below carefully and answer the questions after, in full sentences.

SAM: Good morning my friends.

JUMA: Good morning, Sam.

MADINAH: Good morning, Sam.

SAM: I hope you have read the examination timetable.

JUMA: Examination timetable!

MADINAH: I have. We are going to begin the End of Term Examinations tomorrow.

JUMA: What! I didn't know. Where was it displayed?

SAM: It is on the noticeboard, but I also have a copy in my bag.

MADINAH: Don't worry, Juma. We are going to have a briefing today after lunch.

SAM: What do you think the teachers will talk about?

JUMA: My elder sister told me that they will guide us on how to follow the instructions, how to write our index numbers, our signatures and to organize examination rooms.

MADINAH: That's good. I think they will also tell us the time allowed for each paper.

JUMA: You are right. Let's go and revise our notes. I hope the teachers have set easy questions.

SAM: I also pray so, because I really want to achieve my target.

MADINAH: Indeed, as candidates, we need to work very hard, or else we won't achieve our targets.

JUMA: Let's go and revise.

Activity 1

a) How many people are taking part in the conversation?
b) When was the examination going to begin?
c) Where was the timetable displayed?
d) What took place after lunch?
e) Mention one thing which is talked about during the briefing.

Activity 2

Write a letter to the deputy head teacher at your school requesting him/her to give you a copy of the examination timetable for Midterm One. Ask him/her whether the school will provide the candidates with answer sheets during the Examination or will the candidates carry their own. Use your school address.

(HEALTH TIP: Sanitize or wash your hands frequently with clean water and soap to stay safe.)

SOCIAL STUDIES

Primary Seven

LESSON 1: The Rift Valley

By the end of this lesson, you should be able:

1. give the meaning of rift valley.
2. describe the forces responsible for the formation of the rift valley.
3. identify some of the lakes and mountains found along the rift valley.

Materials you will need

Pens, pencils, notebook and P7 SST textbook if possible

Introduction

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In this lesson, you will learn about the Great African Rift Valley. A rift valley is a long depression with steep sides called escarpment which was formed as a result of faulting. There are four arms of this Great African Rift Valley namely; Ethiopian rift valley, Western arm, Eastern arm (East Africa rift valley) and Malawian rift valley. There also are lakes and mountains along the rift valley.

Step 1. Look at the landform around your local environment and tell us about the height and depth.

Step 2. Describe what you think a rift valley looks like. Compression force and tensional forces are the ones responsible for the formation of the rift valley.

Step 3. Give some of the lakes and mountains that are found along the rift valley.

Summary notes

The Great Rift Valley is the longest rift valley in the whole world with the total length of 72,000km. It starts from Syria and ends at Port Beira in Mozambique. The characteristics of rift valley are:

1. They are deep with steep escarpment.
2. There are lakes such as; Lake Albert, Edward, Kivu, Tanganyika, Rukwa, Natron, Turkana and Baringo.
3. There mountains such as; Mt. Rwenzori, Ulunguru, Usambara and Mt. Pare.

Follow-up activity

1. Try to describe the rift valley.
2. Suggest three lakes found in the rift valley.
3. Identify any one mountains in the rift valley which is not in Uganda.

LESSON 2: Rift Valley

By the end of this lesson, you should be able to:

1. suggest some of the economic activities carried out in rift valley areas.
2. identify some of the values of rift valley lakes.
3. find out some of the problems caused by rift valleys in the areas where it is found.

Materials you will need

Pens, pencils, notebook, P7 SST textbook if possible.

Introduction

In this lesson, you will learn about the economic activities people who live along the rift valley areas do. You will also learn about the importance the rift valley. You will also learn about some problems caused that the people who live along the rift valleys face.

Step 1. Observe the economic activities that people who live in your community are carrying out. Now use those examples to suggest some economic activities carried out in rift valley areas.

Step 2. Look at the landform around your environment and try to find out the uses of land forms to the people in your community. With that information from the uses, tell us the importance of rift valley lakes to the people who live around it.

Step 3. Give some of the problems that people in your community face as a result of the landforms in your area.

Summary notes

Rift valleys have some other features which include lakes, block mountains and escarpments. These features provide different activities for the people, for example, they attract tourists who bring foreign income; fishing grounds which give us fish; mining of minerals found in some rift valley lakes such as crude oil in Lake Albert and Lake Turkana. People who live along the rift valley also face some problems like poor transport network, steep sides which lead to soil erosion.

Follow-up activity

1. Identify any one rift valley lake found in Rwanda.
2. Find out one way in which the Western arm of the rift valley is politically important to Uganda and the Democratic Republic of Congo.
3. Suggest ways in which people who live along the rift valley can solve the problem of soil erosion.

LESSON 3: Coastal Plain

By the end of this lesson, you should be able to:

1. give the meaning of coastal plain.
2. describe the coastal plain.
3. suggest some features that are found within the coastal plain.
4. identify some of the economic activities carried out in this area.

Materials you will need

Pens, pencils, notebook, P7 textbook if possible.

Introduction

In this lesson, you will learn about coastal plains, features found within a coastal plain, values of coral reefs and different economic activities carried out within a coastal plain.

Step 1. Observe the landforms in your environment and try to describe their nature in terms of height and depth.

Step 2. Look at the land in your local environment and try to describe it.

Step 3. Try to explain the general look of the coastal plain by giving examples of features found within the coastal plains.

Step 4. Give some of the problems faced by the people who live in the coastal plains.

Summary notes

A coastal plain is a narrow zone between the sea and land. The coast of East Africa is made up of the coastal plain while the coast of West Africa is made up of the lagoon lakes. Some areas of East Africa coastline have corals. Corals were formed from tiny sea creature called **Polyps.** Corals have limestone which is used in making cement. They attract tourists which brings foreign exchange. The economic activities carried out in coastal plains include; fishing, tourism, mining, farming and lumbering. One of the main problems caused by corals is that they make water transport difficult.

Follow-up activity

1. Describe a coastal plain.
2. Suggest some of the material used for building which are got from coastal plains.
3. Identify some of the work people who live in your environment do to get money.
4. Copy the summary notes in your notebook.

LESSON 4: Savanna Vegetation

By the end of this lesson, you should be able:

1. describe Savanna vegetation.
2. identify the main activities that are carried out in Savanna area.
3. give the major types of Savanna vegetation found in Africa.

Materials you will need

Pencils, pens, notebook and P7 textbooks if possible.

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Introduction

In this lesson, you will learn about Savanna vegetation in Africa. You will learn the characteristics of Savanna vegetation, types of Savanna vegetation, economic activities carried out in Savanna vegetation and the areas of Africa that experience Savanna vegetation.

Step 1. You will learn that the Savanna vegetation is the type that covers most parts of

Africa.

Step 2. You will identify the different activities that people in places with a lot of grass do.

Step 3. You will find out the different types of Savanna found in Africa and their location.

Step 4. You will find out why animal rearing is common in this area.

Summary notes

The largest part of Africa is covered by Savanna vegetation. It has thick grass and scattered trees. It is suitable for animal rearing. The other types of Savanna vegetation are Savanna woodland and dry Savanna. The economic activities carried out in Savanna vegetation are tourism, animal rearing, crop growing and bee keeping. Woodlands are found in parts of central Tanzania, Malawi, Mozambique and Zambia.

Follow-up activity

1. Identify why trees in Savanna vegetation shed their leaves.
2. Give reasons why Miombo woodland is not good for human settlement.
3. Find out from an adult why Savanna grassland is suitable for animal rearing.
4. Mention other economic activities carried out in these areas.

LESSON 5: Tourism Industry

By the end of this lesson, you should be able to:

1. explain the meaning tourism.
2. give reason why tourism is called an industry.
3. identify some of the values of the tourism industry.
4. find out some the problems faced by the tourism industry.

Materials you will need

Pens, pencils, notebook and textbooks (if possible).

Introduction

In this lesson, you will learn about the tourism industry that is common in the Savanna grassland; meaning of tourism; why it is called an industry; its importance, problems and solutions to the problems mentioned.

Step 1: Give the meaning of tourism.

Step 2: Identify some of the reasons why it is called an industry and compare it to any industry in your local environment.

Step 3: Give some of the values of an industry to the people in an area.

Step 4: Give some of the problems faced by the tourism industry.

Summary notes

Tourism is a business where service or facilities like accommodation and food to tourists are provided. It is called an industry because it is a source of employment for people and revenue to the government.

It is called a trade because it involves payment of services. Problems faced in this industry are poaching, animal diseases, shortage of water, fire outbreaks and poor transport network. People carry out poaching to get meat, ivory, hides and skins.

Follow-up activity

1. Give the meaning of tourism.
2. Why is tourism called an invisible trade?
3. Identify any tourist attractions in your area.
4. Point out any problems faced by the tourism industry.
5. Give the importance of the tourism industry to your country.

LESSON 6: Different Climatic Zones of Africa

By the end of this lesson you should be able to:

1. locate different climatic zones of Africa.
2. give factors responsible for different climatic regions.

Materials you may need

Pens, pencils, notebook and P7 SST. textbooks if possible

Introduction

In this lesson, you will learn about the climatic zones found in Africa. We will also learn about factors responsible for the differences in the climatic regions.

Step 1: Find out the different climatic regions that are found in Africa.

Step 2: Name the climatic regions in Africa.

Step 3: Give reasons why these zones are different.

Summary notes

Africa has different climatic zones because of different factors like such as altitude, distance from major water bodies, relief and human activities. The zones include equatorial, tropical, Mediterranean, desert, semi-desert, temperate and montane.

Follow-up activity

1. Give factors responsible for the different climatic zones of Africa.
2. Name the different climatic zones of Africa.
3. Copy the summary notes in your notebook.

LESSON 7: Equatorial Climatic Zone

By the end of this lesson, you should be able to:

1. find out the areas that make up Equatorial climatic region of Africa.
2. name the main economic activities in this area.
3. draw a graph and table showing equatorial climate.

Materials you will need

Pens, pencils, ruler, notebook and SST textbook if possible.

Introduction

In this lesson, you will learn about the climatic zones in Africa and mainly the Equatorial zone. This climatic zone is found in 5^{o} to 10^{o} N and 5^{o} to 10^{o} S of the Equator. It receives rainfall throughout the year. There are major economic activities carried out in this zone.

Step 1. Try to name the area that experiences this type of climate in Africa.

Step 2. Find out the main economic activities carried out in this zone.

Step 3. Draw a table showing this climatic zone.

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Summary note

Equatorial climatic zone is found 5° to 10°N and 5° to 10°S of the Equator. It receives rainfall throughout the year because the sun appears overhead the Equator throughout the year. This is because of high evaporation rate throughout the year. The region is described as hot and wet throughout the year.

Follow-up activity

1. Name countries that are found in this region in Africa.
2. Find out the economic activities carried out in this area.
3. Copy the summary notes in your notebook.

LESSON 8: Tropical Climate

By the end of this lesson, you should be able to:

1. give the meaning of a tropical climate.
2. describe tropical climate.
3. try to name economic activities carried out in this zone.

Materials you will need

Pens, pencils, notebook and textbook if possible.

Introduction

In this lesson, you will learn about the tropical climatic zone. This region lies between 5°to 10° N of the Equator. The zone is located between the Tropic of Cancer and the Tropic of Capricorn. The rainfall decreases as one moves away from the Equator.

Step 1. Observe the condition of weather in your local environment and describe it in terms of temperature.

Step 2. Look at wind and clouds in your local environment and write about their movement.

Step 3. Suggest different activities people do during the windy weather.

Step 4. Suggest some of the problems faced by the people due to strong wind in your local community.

S**ummary notes**

The tropical climatic zone covers the largest part of Africa. This lies between 10° to 15° N and 10° to 15° S of the Equator. This zone is located between the Tropic of Cancer and the Tropic of Capricorn. This region has one long rain season and one short dry season. The rainfall decreases as one moves away from the Equator. The economic activities carried out in this tropical climatic region include cattle keeping, tourism, crop cultivation, human settlement and bee keeping.

Follow-up activity

1. Simple table for tropical climate.

Months	J	F	M	A	M	J	J	A	S	O	N	D
Temp°c	22	24	27	32	31	27	26	25	26	25	25	23
Rainfall in (mm)	0	0	0	25	75	125	200	325	150	25	0	0

What type of climate is shown in the above table?

1. Which month has the highest amount of rainfall received?
2. What was the lowest temperature recorded?
3. Calculate the temperature range?
4. Copy the summary notes in your notebook.

LESSON 9: Desert Climate

By the end of this lesson, you should be able to:

1. give the meaning of desert climatic zone.
2. describe desert climate.
3. suggest some economic activities carried out in this zone.
4. identify countries that experience this type of climate in Africa.

Materials that you will need

Pens, pencils, notebook and textbook if possible.

Introduction

In this lesson, you will learn about the desert climatic region. Desert climate is found in the Tropic of Cancer and Tropic of Capricorn. This region is very hot during the day and very cold during the night. The average temperature goes to about 50°C during the day and 4°C during the night.

Step 1. Suggest the temperature of the day time at around 2:00pm.

Step 2. Try to find out some of the economic activities carried out by the people who live in this

type of climate in Uganda.

Step 3. Identify any one way in which climate influences people's ways of living. For example, people

living in deserts wear turbans to protect their heads from strong sun and heat.

Step 4. Try to inquire from your parents/ guardians the areas in Uganda that experience dry condition. The countries in Africa that have desert-like climate are: Libya, Egypt, Tunisia, Morocco, Sudan and Mauritania.

Summary notes

Desert climatic region is described as hot and dry throughout the year. The average temperature ranges to about 50°C during day and 4°C during the night. Deserts lack rainfall because they receive dry wind that carries no moisture. People in the desert build houses with flat roofs to prevent strong wind from blowing their roofs off. Desert areas do not have cloud cover to absorb heat during the day so as to send it back to earth in the night. They have clear skies and a lot of storms which gather forming sand dunes.

Follow-up activity

1. Describe the desert climate.
2. Suggest how crop farming is made possible in this region.
3. Give some of the reasons why people in the desert lack rainfall.
4. Write in your notebook the summary notes.

LESSON 10: Mediterranean Climatic Zone

By the end of this lesson, you should be able to:

1. give the meaning of the Mediterranean climatic zone.
2. try to describe Mediterranean region.
3. suggest some of the economic activities carried out in this zone.
4. locate the areas that experience this type of climate.

Materials you will need

Pens, pencils, notebook and textbooks

Introduction

In this lesson, you will be learning about the Mediterranean climatic zone. This region is described as hot and dry summer and cool and wet winter. Westerlies wind is responsible for Mediterranean climatic zone in Africa. Citrus fruits grow in this region.

Step 1. Mediterranean climate is described as having hot and dry summer and cool and wet winter.

Step 2. Mediterranean climate favours the growing of citrus fruits and other crops such as

wheat, oat and barley.

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Step 3. The countries in the northern tips of Africa and southern Africa which experience this type of climate are: Libya, Tunisia, Algeria, Morocco and South Africa.

Summary notes

Mediterranean climatic zone of Africa temperature ranges from 12°C to 24°C. The rainfall received throughout the year is between 36mm and 750mm. The characteristics of Mediterranean climate are:

i) Hot and dry summer.
ii) Cool and wet winter.
iii) Citrus fruits like oranges, lemons, tangerine, apple and pears are grown; livestock farming (sheep and goats rearing) and tourism is carried out.

Follow-up activity

1. Describe the Mediterranean climate.
2. Suggest crops which are grown in this region.
3. Identify some of the animals kept in this region.
4. Copy the summary notes in your notebook

LESSON 11: Location and Names of Vegetation of Africa

By the end of this lesson, you should be able to:

1. give the meaning of vegetation.
2. write the types of vegetation.
3. list the types of natural vegetation.
4. draw the map of Africa showing different vegetation types.

Materials you will need

Pens, pencils, notebooks, Atlas and an SST textbook if available.

Introduction

In this lesson, you will learn about the vegetation of Africa. You will look at the meaning of vegetation, types of vegetation, and types of natural vegetation found in Africa and draw a map of Africa showing different types vegetation.

Step 1. Move around your local environment and name the trees, grass, flowers and crops that you see in your local environment and the community. How would you define vegetation?

Step 2. Do you remember what you learnt about vegetation in P6 last year? Try to group the vegetation into two categories that is, natural and planted vegetation and then give the meaning of what natural and planted vegetation is. While natural vegetation is the plant cover of an area that grows on its own, planted vegetation grows with the care of people.

Step 3. You can now find out the different types of natural vegetation in Africa e.g. Equatorial/tropical rainforest, Savanna, grasslands, Montane vegetation, Desert, Semi-Desert, Mediterranean, Temperate and Mangrove.

Follow-up activity

1. Move around your local environment and identify the trees that were planted by people and those which have grown naturally. You can also find out their local names.
2. Draw at least one tree species that grows in your local area.
3. Draw a map of Africa showing different vegetation zones.
4. List the planted and natural vegetation.

LESSON 12: Equatorial Vegetation

By the end of this lesson, you should be able to:

1. locate on the Equatorial vegetation/tropical rainforest on the map of Africa.
2. give example of trees found in Equatorial vegetation zone.
3. identify countries where Equatorial/tropical rainforests are found.
4. list the importance of Equatorial/ tropical rainforest.

Materials you will need

Pens, notebooks, pencils and SST textbook if possible.

Introduction

In the last lesson, you learnt about types of vegetation and examples of natural vegetation. Today you will learn about Equatorial vegetation which is also called Tropical rainforest and where it is located.

Step 1. Observe the plants in your local environment and describe the colour of most vegetation.

Step 2. Look at the trees found around your local environment and tell us about their height and size. Most trees within this region are tall and ever green.

Step 3. Describe the types of forest found in your area. Use this experience to relate it to Equatorial/tropical rainforest.

Step 4. Think of how useful the trees that you have seen in your environment are to people, animals and birds.

Summary notes

Equatorial vegetation is described as ever green throughout the year. The region receives plenty of rainfall as well. This kind of vegetation has some common characteristics which include;

i) The trees have broad leaves.
ii) The trees form layers called canopy.
iii) The trees have hard wood.

Can you suggest examples of hard wood trees found in your local area? Other examples include; Mvule, Mahogany, Ebony and Rose wood.

Follow-up activity

1. Describe the colour of most trees you see in the community during the different seasons.
2. Give a brief description of the trees found around your community.
3. Explain how trees are grown in your local area.
4. Copy in your notebook the summary notes

LESSON 13: Desert and Semi-Desert Vegetation

By the end of this lesson, you should be able to:

1. give the meaning of desert and semi-desert vegetation.
2. describe the desert and semi-desert vegetation.
3. identify some of the trees that grow in this area.
4. explain how farming is made possible in this area.

Materials you will need

Pens, notebooks, pencils and SST textbook if possible.

Introduction

In this lesson, you will learn about Desert and Semi-desert vegetation. Desert and Semi-desert is a dry area. Desert vegetation is found in hot and dry climatic regions of Africa. It has very little vegetation. There are thorny trees, bushes and shrubs. Desert areas have short and rough grass. The trees there have thick barks and thin leaves.

What do you think helps these trees to survive in desert areas?

Step 1. Observe the plants in your local environment and describe their nature in terms of growth.

Step 2. Look at the trees found around your local environment and tell us about their height and size.

Step 3. Explain what you think desert vegetation looks like; use an example of vegetation in your local area especially when it a dry season.

Step 4. Give some of the problems faced by the people in your community during

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the dry season or drought.

Summary notes

Desert and semi-desert climate zone is described as hot and dry. This area receives little rainfall and has high temperature throughout the year. The following are some of the areas in Africa which experience desert climate; Libya, Morocco, Egypt, Mauritania, Angola, Chad, Mali, Sudan and South Sudan. The most common activity in this area is cattle keeping, mining and tourism. The trees have waxy bark, long roots that absorb water deep underground; they have thick bark and thin leaves. Trees include Cactus, Baobab, and Acacia. Desert and semi-desert areas receive little rainfall throughout the year.

Follow-up activity

1. Describe desert vegetation.
2. Suggest trees that grow in the desert region.
3. Give some of the reasons why people keep cattle in your areas.
4. Write in your notebook the summary notes.

LESSON 14: Mangrove Vegetation

By the end of this lesson, you should be able to:

1. describe the Mangrove vegetation.
2. locate areas where Mangrove vegetation are found in Africa.
3. Give the importance of Mangrove vegetation.

Materials you will need

Pens, pencils, notebook and P7 SST textbook, if possible.

Introduction

In this lesson, you are going to learn about the Mangrove vegetation. Mangrove vegetation has tropical trees that grow along the coastlines of Africa on muddy floods.

Step 1. Describe this type of vegetation. It is found in areas along the coast with plenty of salty water.

Step 2. Look at the swamps and try to compare with the Mangrove vegetation. This type of vegetation grows at the coast of Africa (coast of East Africa and West Africa).

Step 3. It is important to note that Mangrove vegetation has some similarities with swamp vegetation.

Summary notes

Mangrove vegetation has strong roots that grow above the ground in the area with plenty of salty water at the coast of Africa. The trees provide hard wood which are waterproof used to build boats and ships. This type of vegetation provides breeding places for fish and mangrove roots help to trap mud and other deposits entering the sea or ocean. They are a source of food for fish.

Follow-up activity

1. Identify the importance of swamps to the community.
2. Find out from elders the products that are got from swamps.
3. Think of some of the reasons why people drain swamps in Uganda today.

LESSON 15: Mountain/Montane

By the end of this lesson, you should be able to:

1. describe the Mountain/Montane vegetation.
2. identify areas in Africa that experience this type of vegetation.
3. draw the illustration showing Mountain/Montane vegetation.

Materials you will need

Pens, pencils, SST textbook, if possible

Introduction

In this lesson, you will learn about Mountain vegetation and examples of crops grown in this vegetation zone. You will learn how altitude affects the vegetation distribution. You will identify some uses of bamboo to both people and animals found in this region.

Step 1. You will try to describe the types of vegetation that grow around mountain areas.

Step 2. Identify the areas in Africa that experience this type of vegetation.

Step 3. Describe the types of vegetation that grow in different altitudes.

Summary notes

This type of vegetation that grows on mountainous areas is found in places like around Mt Rwenzori, Mt Elgon and Mt Kilimanjaro. Other parts of Africa where this type of vegetation is found are Drakensberg mountain in South Africa, Atlas mountain in Morocco, and Ethiopian highland in Ethiopia. Vegetation grows according to change in altitude. It varies from the peak of the mountain to the bottom. Common trees found in this area include: Cedar, Spruce, Pine, Bamboo, and Fir. What is the use of bamboo trees to people in your community?

Bamboo is used for construction of houses; it is eaten as food; it is used to make furniture; for human activities including farming and tourism. help to trap mud and other deposits entering the sea or ocean. They are a source of food for fish.

Follow-up activity

1. Try to find out the types of Mountain vegetation found in different altitudes.
2. Identify areas in Africa where this vegetation is experienced.
3. Draw an illustration showing Mountain vegetation.
4. Copy summary notes in your notebook.

LESSON 16: Temperate Vegetation

By the end of this lesson, you should be able to:

1. identify areas that have this types of vegetation in Africa.
2. locate this vegetation region.
3. identify some economic activities carried out in this zone.

Materials you will need

Pens, pencils, SST textbooks if possible, notebook

Introduction

In this lesson, you will learn about temperate vegetation which grows in temperate climatic zone. It is commonly found in South Africa. It is called Veldt and it is-sub divided into low and high veldt. The economic activities carried out are mainly farming and tourism.

Step 1. Study the map of Africa and locate areas where temperate vegetation is found in Africa.

Step 2. What do you think the word **temperate** means? Temperate vegetation zone has mainly grasses covering large areas.

Step 3. Now you can learn about some of the characteristics of this vegetation zone. The grass species found in the area are of the same kind. You find few short trees and shrubs. There is short and ever green grass during spring and early summer.

Step 4. Find out the suitable activity that can be done in an area with plenty of grass.

Summary notes

Temperate vegetation grows in temperate climatic zone. Maize is the major crop grown in the High Veld of South Africa. The main economic activities carried out in the Lower Veld are: dairy farming, ranching, sheep rearing and goat rearing.

Follow-up activity

1. Find out the areas in Africa that have temperate vegetation.

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2. Describe the characteristics of temperate vegetation zone.
3. Identify some of the economic activities carried out in this region.
4. Copy the summary notes in your notebook.

LESSON 17: Mediterranean Vegetation

By the end of this lesson, you should be able to:

1. identify parts of Africa which have Mediterranean vegetation.
2. describe the characteristics of Mediterranean vegetation.
3. identify some trees in this zone.

Materials you will need

Pens, pencils, notebook, SST textbook if possible

Introduction

In this lesson, you will learn about Mediterranean vegetation, the parts of Africa where it is located, the types of vegetation found there and some human activities carried out in this vegetation zone.

Step 1. You will be expected to locate the part of Africa that has Mediterranean vegetation. Study the map of Africa showing vegetation and point where the Mediterranean vegetation is found. Identify the countries that experience such vegetation in Africa.

Step 2. Think about the type of vegetation that can be found in this region and give its characteristics. The common tree species include; pine, cedar, fir, cypress, olive and oak.

Step 4. Suggest some of the activities that you think can be done in an area with trees that have short and thin leave.

Summary notes

Mediterranean vegetation is found in the Mediterranean climatic zones of Africa. The characteristics of this vegetation zone are: the plants have long and wide spread roots. Trees in this zone shed off their leaves during the dry season.

Follow-up activity

1. How can we describe the Mediterranean region?
2. Try to name some of the crop trees that are grown under citrus fruits.
3. Name the region in South Africa that has this vegetation.

INTEGRATED SCIENCE

Primary Seven (P7)

Before we start our lesson, do not forget that COVID19 is a disease affecting every country in the world:

To protect yourself from COVID-19;

- **Stay at home.**
- **Keep a distance of at least 1 metre from other people.**
- **Wash your hands very well with soap and water regularly.**
- **Do not touch the soft parts (eyes, nose, mouth) because the virus can pass through these to enter the body.**
- **Do not to spit anywhere.**
- **Cover your mouth with a tissue when coughing.**
- **Use a tissue for your nose when sneezing.**

LESSON 1: Electricity

Introduction

Electricity as a form of energy

There is a time when a watch/clock/radio which uses batteries or cells, reaches a point and stops working. If you need to use a fan or kettle, it has to be plugged into a socket and power switched on for it to work. All these devices use a form of electricity as their source of energy. Without electricity, none of these can work. Electricity is a form of energy produced by charges.

Uses of electricity

Electricity as a source of energy is used by different devices which convert it from one form to another. The following devices enable us to use electricity. Fill in the gaps in the table below.

Device	Changes electricity into	Use
Bulb	Heat and light energy	Lighting a room
Electric fan	Kinetic energy	_____
Electric kettle	_____	Boiling water
Radio speakers	Kinetic and sound energy	_____

Types of electricity (current, static)

There are two types of electricity. These are **static electricity** and **current electricity**.

We earlier learnt that electricity is caused by charges. Static electricity is caused by charges that are stationary (not moving) while current electricity is produced by moving charges.

Experiment to show the presence of static electricity

1. Tear a piece of paper into very small pieces.
2. Place these pieces of paper on a flat surface.
3. Bring a pen close to the small pieces of paper.
4. Rub the pen in your hair for about one minute and bring it close to the pieces of paper again.

Activity 1

1. What happens to the pieces of paper the first time a pen is brought close to them?
2. What happens the second time a pen is brought close to the pieces of paper?
3. Explain the reason for the change in behaviour of the papers in the two activities.

All devices that use batteries, dry cells, or hydro electricity use current electricity.

Sources of electricity

Identify and draw the source of electricity for the following devices

Device	Source of electricity	Drawing
Torch / Radio		
Watch		
TV screen		
Bulb		
Solar bulb		

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Summary

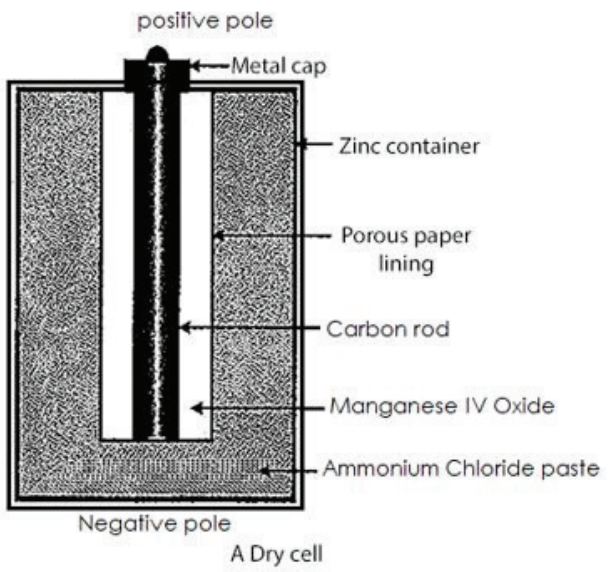
Electricity can be produced from different sources. These include;

1. Dry cell; any system that changes chemical energy into electrical energy.
2. Batteries; a group of cells connected together.
3. Solar panels; a system that changes energy from the sun into electrical energy.
4. Generators; a device that changes kinetic energy into electrical energy.

The dry cell

Study the diagram below and refer to it as you read about dry cells.

A dry cell changes chemical energy into electrical energy. It consists of two ends (terminals). One end has a positive charge while the other has a negative charge. There are chemicals inside the dry cell that react to produce electricity.



A Dry cell

The metal cap is the positive terminal. It covers the carbon rod.

The Zinc container is the negative terminal.

The ammonium chloride and zinc are the chemicals that react to produce electricity.

The manganese IV Oxide acts as a depolariser. This helps to remove bubbles of gases produced in the cell.

Conductors and insulators

Materials can be classified into two according to whether they allow electricity to flow through them or not. They are either conductors or insulators.

Conductors are materials that allow electricity to pass through them. Examples of conductors include metals like; copper, aluminium, silver, iron, mercury, etc. Water and carbon (graphite) also conduct electricity.

Conductors are used for;

i) making circuits in devices
ii) overhead transmission of electricity
iii) wiring in houses

Insulators are materials which do not allow electricity to flow through them. Examples of insulators include rubber, glass, plastic and dry wood.

Importance of insulators

i) They protect electricity users from electric shock.

ii) They prevent short circuits when wiring.

Safety precautions in handling electricity and electrical appliances

Read the following advert by UMEME

PUBLIC NOTICE

Dear Client, now that the rain season is here, you need to protect yourself and your loved ones from the dangers of electrocution. Observe the following;

- *Ensure that your houses are connected by qualified technicians.*
- *Ensure that there are no naked wires in your house.*
- *Ensure that children don't touch naked wires with wet, bare hands.*
- *Do not use metallic materials as cloth lines (for spreading clothes to dry)*

Thank you.

Activity 2

Explain the term electrocution.

Mention one action you can take when you see naked wires in or outside t the house.

Mention any two materials you can use as cloth lines.

Electricity is very useful but it can also be very dangerous. Electricity can cause death through electrocution. Electricity can cause fires that can destroy property. This therefore means we need to be careful when dealing with electricity. When you touch a naked wire that is carrying electricity, the current will pass through you into the earth. This will kill your body cells and you can die. So, there should be an insulator between you and any wire. This is why wires are insulated.

The table below shows the safety practices we should take when using electricity.

Practice	Reason
1. Insulate electric wire	To prevent touching live wires
2. Put lightning arrestors on houses	Protect houses from lightning
3. Putting on shoes with rubber soles	Rubber soles cut flow of current into the earth
4. Reading instructions on electrical devices	_____
5. Using appliances with insulated handles	_____
6. Having qualified technicians to wire your houses	_____
7. Clean any water on the floor	Water conducts electricity

Complete the table and present this to your teacher of Science when you go back to school

Follow-up activity

The picture below is of the back side of an electrical device. Use it to answer the questions that follow



1. Identify the country in which the above device was made.
2. Identify the company that made the device.
3. State the voltage range that the above device can use.
4. If a similar device was labelled 95W, explain which of the two you would prefer to buy.
5. Identify one safety measure stated for the above machine.

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MATHEMATICS

SET CONCEPT

FINITE AND INFINITE SETS

Materials that you will need are

Pen, an exercise book, geometry set cups.

INTRODUCTION

You are welcome to this interactive learning of finite and infinite sets. In Primary five and six you learnt about different types of sets. Look into your geometry set. How many members can you count? Ask somebody near you to identify more items round your home that form up sets.

A set of cups, a set of glasses, a set of forks etc.

Write down a set of letters in the word corona. Count the members in that set. How many have you got? So you can count the members of that set and finish them. We call it a finite set. A finite set is a set whose members can be counted and finished. Another example of a finite set is a set of cups in your home.

Get a piece of paper, write numbers from 1, 2, 3, 4,5, ____ ____ and continue to see how far you can write them down. How many numbers have filled the paper? You have written large numbers that cannot fill the paper so when a set has elements we can never finish counting, it is called an infinite set. An example of an infinite set is a set of square numbers Q = {1, 4, 9, 16, 25, 35, 49, ...}

Members of set Q

Q = {square number}

= {1, 4, 9, 16, 25, 36, 49, __, __}

Exercise

State whether each of the sets below is Finite or Infinite sets.

1. P is a set of all even numbers
2. M is a set of all multiples of 5
3. A is a set of counting numbers
4. N is a set of all factors of 6
5. W is a set of all odd numbers between 70 and 80
6. X is a set of all Prime numbers.

Activity

Get a pen and a paper, list down some of the items found at your home. Name this set H. How many members has set H?

"Stay at home, life is important"

SUBSETS

In this lesson, you will learn to

i) Form subsets from finite set
ii) Derive the formula for finding the number of subsets.
iii) Apply the formula to find number of subsets.

MATERIALS NEEDED

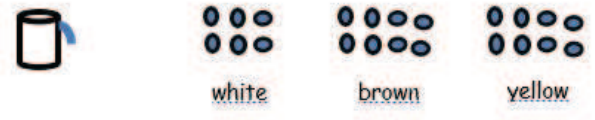
Pen, book, beans

INTRODUCTION

In primary six you learnt about universal set which is a mother set. Today you are going to learn about subsets which are got from the mother set or universal.

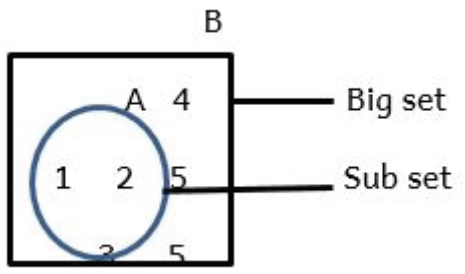
Example 1:

Pick a cup of beans from the store. Separate these beans according to their colors. For example if my cup had yellow, brown and white beans they can be separated as shown.



How many groups of different beans have you formed from a big set (cup)? The groups formed are subsets of a set of beans you originally had in a cup.

A subset is a small set formed from a big set as shown in the figure below.



Example 2: Set K is a set of multiples of 3 less than 10.

How many subsets can you get from set K?

1st Identify the multiples of 3. K = {3, 6, 9}

Every element of the set forms a subset. Therefore the sets with one element {3}, {6}, {9} as subsets of set K.

Sets with 2 elements {3, 6}; {3, 9}; {6, 9} are subsets of set K.

Empty set { } is always a sub set of any set. So it is also a subset of set K.

Mother set is always a sub set {3, 6, 9}

Total number of subsets of set K = 8.

A set with only three members had 8 subsets. If the mother set had more numbers, it means we would get more subsets. There is a n alternative way of finding the number of subsets without having to list each the subsets. The table below is very helpful. Kindly look at it.

Number of elements in A set	Number of sub sets	Powers of 2^n	2^n (Formula)
0	1	2^0	1
1	2	2^1	2
2	4	2^2	2x2
3	8	2^3	2x2x2
4	16	2^4	
5	32	2^5	
6	64	2^6	2x2x2x2x2x2

This simply you can find the number of subsets for any set given the number of members. To get the number of subsets,

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first count the number of element in the set. Then use the formula 2^n. where n is the number of elements in a given set.

Exercise

1) Given the set Y= {C,O,V,I,D}.
   a) Write down the different subsets for set Y.
   b) State the number of subsets for set Y
2) T is a set of the first 3 whole numbers
   a) Write down the members of set T.
   b) Write down the subsets of set T
3) H is a set of square numbers between 8 and 20.
   a) Write down the members of set H
   b) List the subsets of set H

2. Use a formula to find the number of subsets in the following sets

i) P = {C,O,R,O,N,A}

ii) W = {4, 5}

iii) K = {0, 1, 2, 3, 4}

iv) X = {P, Q, R}

USE OF VENN DIAGRAMS

In this lesson you will learn how to

i) Represent information on the Venn diagram
ii) Solve mathematical questions involving Venn diagram

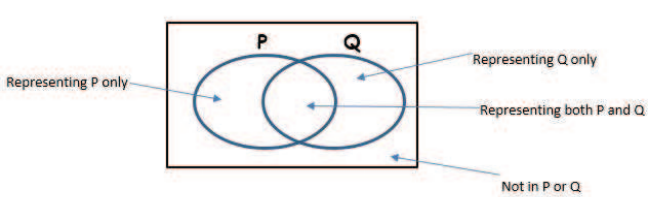
Materials needed

Pen, a paper

INTRODUCTION

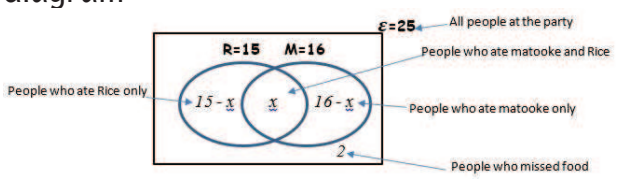
In primary six you learnt how to represent the intersection and union of sets on Venn diagrams. In this lesson you are going to learn more about using Venn diagrams to represent information.

The figure below shows the meaning of the different regions for sets P and Q.



Example 1: 25 people attended James' graduation Party. 15 people ate Rice, 16 ate matooke and x people ate both Rice and matooke. 2 people missed the food.

Represent the information on a Venn diagram



i) How many people ate both?

To solve this questions, you add and equate all the values inside the set to the total number in the universal set.

15- x + x + 16 – x + 2 = 25
15 + 16 + 2 + x – x- x = 25

15 + 16 + 2 + x – x - X = 25
33 – X = 25
33 – 33 – X = 25 – 33
-X = -8
-1 -1
X = 8 people

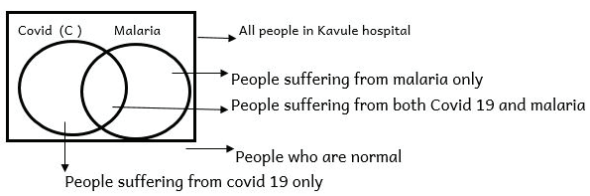
8 people ate both rice and matooke

Number of people who ate Rice only = 15 –x
But x = 8 so 15 – x = 15 -8 = 7 people

=8 people

ii) How many ate matooke only?

Example 2:



At Kavule hospital, 25 people attended malaria checkup. 15 were found with COVID 19, 16 were found with malaria and X people had both diseases. 2 people were did not have any of the tow diseases.

i) Represent the above information on the Venn diagram.
ii) How many people suffered from both diseases?

8 people suffered from both diseases

Number of people who had COVID 19 only = 15 – x but X = 8

So 15 –x = 15 -8 = 7 people.

Number of people who had malaria only = 16-x but x = 8

So 16 – 8 = 8 people.

Practical Activity: Get 2 pieces of paper. On one piece, write the names of animals that live on land and on the other write the names of animals that leave in water. Make two sets with animals that live in water only, land only and those that live both on land and in water.

Exercise

1. 50 pupils in a class were asked their favorite soda. 29 pupils liked Coco-cola (C),

24like Fanta (F) and D pupils like both coco-cola and Fata. At least each pupil

liked one of the two. Represent the given information on a Venn diagram.

Find the number of pupils who liked

i. Both sodas
ii. Fanta only
iii. Coca-cola only

2. In a village there are 50 farmers who grow maize. During the harvesting period.

32 farmers sell fresh maize and 20 farmers sell dry maize while T farmers sell both fresh and dry maize while 4 of the farmers do not sell any of the two

Represent the information above on a Venn diagram.

PROBABILITY

In this lesson you will learn to work out the probability of events

Materials needed

Pen, a paper, coins, die

INTRODUCTION

When you toss a coin, you will get a head or a tail. What you are going to get

cannot be determined before the coin is tossed. In the same way, If you roll a die will obtain 1, 2, 3, 4, 5 or 6. Probabilities are associated with experiments where the outcome is not known in advance or cannot be predicted. Probability measures the chances of an event happening.

The chance of an event happening is called probability.

Probability of an event is given by the formula

$$\text{Probability} = \frac{chances\ of\ an\ event\ hapening}{Total\ number\ of\ possible\ outcomes}$$

For example, a coin has two sides. Therefore the total number of possible outcomes is 2. The chance of getting a head is 1. A die has six sides. The chance of getting any of the sides is 1. The total number of possible chances is 6.

Examples

1) A die has six faces numbered 1 to 6. Calculate the probability that:-

i) A five will show up
ii) A prime number will show up?
iii) A composite number will show up?

i) A five is one side of the die. All the six sides have equal chances of appearing. Therefore a five has one chance out of six. Six is the total number of possible outcomes since any of the sides can show up.

$$\text{Probability of getting a 5} = \frac{1}{6}$$

A prime number is a number that has only two factors. That is one and itself. The prime numbers on the sides of a die are 2, 3, and 5. The number of chances of getting a prime number is 3.

Probability of getting a Prime number =

ii) A composite number is a number that has more than 2 factor. Numbers on the die that are composite are 4 and 6. The there are two chances of getting a composite number.

iii) Probability of getting a composite number =

When determining the probability of events that have a number of events, the formula for finding the probability is

Probability of an event =

Activity

1) In basket there are 8 red pens, 4 blue pens and 7 black pens. What is the probability of choosing a blue pen from the basket?
2) A class has 15 boys and 18 girls. A student is picked at random. What is the probability of picking a
   a. Girl
   b. Boy
3) A crate of soda has 8 bottles of Mirinda, four bottles of mountain dew and the rest are Pepsi cola. If a bottle is picked at random, what is the probability of picking a
   a. Mirinda
   b. Mountain Dew
   c. Pepsi Cola

NUMBER PATTERNS AND SEQUENCES

As you do this lesson, you need a pen, book, bricks

INTRODUCTION

Many patterns occur in our daily life. You observe this when you look at the clothes you put on, animals like giraffe and zebras also have patterns on their skins. In this lesson you are going to learn about patterns and sequence with whole numbers.

Try out this activity practically.

Peter arranged his bricks in the order you see below.



How many bricks did peter use to make this shape?

How many bricks would Peter need to make a similar shape with

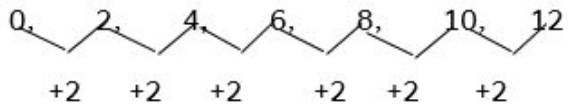
i. 4 rows
ii. 5 rows

What is the relationship between the number of bricks peter needs to make complete rows (row 1, row 2, row 3, ... Row 5)

Introducing sequences

The number of bricks needed for each of the rows to be complete has a relationship. This is what makes the sequence. To find the next number in a sequence you need to find this relationship. It can be obtained by adding, subtracting, multiplying or diving. The example below shows a sequence where to find the next number you add 2 to the previous umber.

(i)



(ii) Find the next two numbers in the sequences

1, 3, 5, 7, ____, ____, ____.

Identify the type of numbers then fill in the next numbers two numbers.

The given numbers are odd 1, 3, 5, 7, 9, 11, 13

Exercise

Find the next 2 numbers in the sequence

1. 0, 2, 4, 6, ____, ____.
2. 1, 4, 9, 16, ____, ____.
3. 1, 8, 27, 64, ____, ____.
4. 27, 9, 3, 1, ____, ____.
5. 100, 81, 64, 49, ____, ____.

COMPOSITE, PRIME, EVEN AND ODD NUMBERS

MATERIALS NEEDED

Pen, paper, sticks and counters you can get from environment.

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INTRODUCTION

In Previous class you learnt about numbers. In this lesson you are going to learn more on some other types of numbers.

Even and odd numbers

Collect the following number of sticks 1, 2, 3, 4, 5, 6, 7, 8, 9 make pairs from these sticks.

Write number of sticks that leave a remainder when paired and those that do not.

Fill in the table.

Number of sticks that leave a remainder when paired	Number of sticks that do not leave a remainder when pared

Numbers that leave a remainder when divided by 2 (pained) are odd numbers.

Numbers that do not leave a remainder when divided by 2 (paired) are Even numbers.

Whole numbers	0	1	2	3	4	5	n
	0 x 2	1 x 2	2 x 2	3 x 2	4 x 2	5 x 2	n x 2
Even numbers	0	2	4	6	8	10	2n
	0 + 1	2 + 1	4 + 1	6 + 1	8 + 1	10 + 1	2 n + 1
Odd numbers	1	3	5	7	9	11	2n + 1

When you multiply a whole number by 2 and add 1 you get an odd number.

Prime numbers and composite numbers

In the next exercise you are going to identify the prime numbers between 1 and 100 using the table of values shown below.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Instructions.

i. Cross out numbers from 1 to 10 a part from 2, 3, 5 and 7.
ii. Cross out all multiples of 2, 3, 4, 5 and 7
iii. Write down all the numbers that remain uncrossed.
iv. Write down the numbers that are crossed.
v. Un crossed numbers are Prime numbers and crossed ones are composite numbers.

Prime numbers have only 2 factors 1 and itself e.g 2, 3, 5, 7, 11, -------

Composite numbers have more than 2 factors e.g 4, 6, 8, 9, 10, -------

EXERCISE

1. Write down the prime numbers less than 30.

2. Find the difference between the 8^{th} and 11^{th} composite numbers.

3. Set W = {numbers which are both composite and prime}. Find n (w).

4. Set t = {even prime numbers}

Find n (t)

DIVISIBILITY TEST

By the end of this lesson

You will test for divisibility of6
(ii) 8 (iii) 9 (iv) 10
(v) 11

Materials needed

Pen, a paper, counters

INTRODUCTION

A packet of sweets has many sweets. If you want to share these sweets equally between you and your brothers and sisters, what is the quickest way to deal with this challenge? How do you make sure that the sweets are equally distributed?

Use of divisibility tests helps overcome such challenges. This topic is not new because in primary 6 you did divisibility tests for 2, 3 and 5.

A number is divisible by another number if the quotient is a whole number and there is a zero remainder.

Divisibility test for 6

A number is divisible by 6 if it is a multiple of 2 and 3 or divisible by both 2 and 3. Check these numbers whether they are divisible by 6.

20	36	75	144	104	204

Divisibility test for 8

A number is divisible by 8 number formed by last 3 digits divisible by 8.

Check whether these numbers are divisible by 8

Number	Number formed by last 3 digits	Is number formed by last 3 digits divisible by 8
5792	792	792÷ 8 =99
9466	466	466 ÷ 8 =58 r 2

5792 is divisible by 8 since number formed by last 3 digits is divisible by 8.

9456 is not divisible by 8 since the number formed by the last 3 digits is not divisible by 8.

Hence a number is divisible by 8 when a number formed by last3 digits is divisible by 8.

Number	Number formed by last 3 digits	Is number formed by last 3 digits divisible by 8
5792	792	792÷ 8 =99
9466	466	466 ÷ 8 =58 r 2

Divisibility test for 9

A number is divisible by 9 if the sum of its digits is divisible by 9.

Check these numbers by dividing them by 9.

Number	Sum of the digits	Is sum divisible by 9?
873	8 + 7 + 3 = 18	18 ÷ 9 = 2
28642	2 + 8 + 6 + 4 + 2 = 22	22 ÷ 9 = 2 r 4
39258	3 + 9 + 2 + 5 + 8 = 27	27 ÷ 9 =3

Hence a number is divisible by 9 when the sum of its digits is divisible by 9 (Multiple of 9)

Divisibility test for 10.

A number is divisible by 10 when it ends in with digit 0.

Divisibility test for 11.

A number is divisible by 11 if the sum of its digit pairs is divisible by 11.

Check these numbers by dividing them by 11. 11111, 676390

Number	Sum of the digit pairs	Is sum divisible by 11?
22333	33 + 23 + 2 = 58	58 ÷ 11 = 5 r 3
107404	04 + 74 + 10 = 88	88 ÷ 11= 8
733689	89 + 36 + 73 = 198	198 ÷ 11 =18

A number is divisible by 11 when the sum of the digit pairs is divisible by 11. Or a multiple of 11.

Exercise

1. Which of these numbers are divisible by 6? 102, 295, 447, 1788, 14569

2. Which of these numbers are divisible by 8?

1332, 98460, 48648, 320656, 313464

3. Which of these numbers are divisible by 9?

6516, 8024, 16812, 93860

4. Which of these numbers are divisible by 11?

13437, 11122, 22344, 276155, 107415

Activity:

There are 82 members in a choir standing in rows as they perform drama against COVID 19. Can the singers be able to stand in 6 equal rows?

WHOLE NUMBERS

BASE TWO

Materials needed

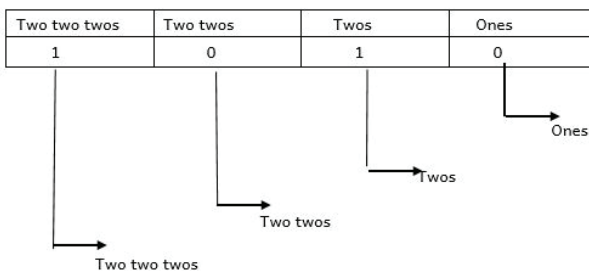
Pen, an exercise book, a ruler, counters. These can be bottle tops, sticks, straws or anything else from your environment.

INTRODUCTION

There are some things we buy in pairs. Can you think of any? Dry cells, shoes and socks are some of the items sold in pairs. Grouping in twos is a system of counting called base two (binary system) Let us learn about base two. Base two uses only 2 digits 0 and 1. Our usual base ten uses ten digits 0-9.

Comparing base two with base ten

Base 10 number	groups	
1.	1 group of ones	1_{two}
2.	1 group of twos and 0 group of ones	10_{two}
3.	1group of twos and 1 group of ones	11_{two}
4.	1 group of two twos, 0 group of twos and group of ones	100_{two}
5.	1 group of two twos, 0 group of twos and group of ones	101_{two}
6.	1 group of two twos, 1 group of twos and group of ones	101_{two}



The number 1010two has been written above showing the place values of each digit.

Whenever we have more than 1 we start another column

Example:

Change 11_{two} to base ten

This is similar to what you learned in Primary six about converting from one base to another. For this example let us start by drawing a place value table for base two.



Activity: Change 1010_{two} to base ten.

1. Draw a place value table for base two
2. Match the digits in the table
3. Multiply the digits with the respective place value
4. Add the products to get the required answer

Exercise

Write down the place value of each digit in the following:

i) 101_{two} ii) 1101_{two} iii) 10_{two}

Change the following to base 10

iii) 110_{two} ii) 101_{two} iii) 1111_{two} iv) 1000_{two}

i) Uganda has experienced 1001two victims of corona various. How many people were affected?

ADDITION AND SUBTRACTION OF BASE TWO NUMERALS.

Materials needed

A pen, an exercise book, a ruler, counters of any kind within your environment.

INTRODUCTION

In Primary six we wrote numbers in base five, the process of counting in base 5 is similar to that of counting in base ten.

When adding numbers in base two and the sum is more than 1, you divide the sum by 2 and write the remainder in that place value and carry what you get in the next place value. Follow through these examples.

$1\ 1_{two}$	1 + 1 = 2	2 ÷ 2 = 1r0
$+1\ 1_{two}$	1 + 1 + 1 = 3	3 ÷ 2 = 1 r 1
$1\ 1\ 0_{two}$		

Example on subtraction: When subtracting we take the place value knowledge as the key.

$1\ 1\ 1\ 0_{two}$

$-\ 1\ 0\ 1_{two}$

Answer

$1\ 1\ 1\ 0_{two}$

$-\ 1\ 0\ 1_{two}$

$1\ 0\ 0\ 1_{two}$

Explanation of how the subtraction was done.

Step1: Ones 0 - 1, regroup 1 from twos

2 - 1 = 1

Step 2: Two 0 - 0 = 0

Step 3: Two twos 1 - 1 = 0

Step 3: Two two twos 1 - 0 = 1

Exercise

Add

1. $1\ 1_{two}$ $+1_{two}$
2. $1\ 1_{two}$ $+1\ 1_{two}$
3. $1\ 1\ 0\ 1_{two}$ $+\ 1\ 1\ 0_{two}$
4. $1\ 1\ 0\ 0\ 1_{two}$ $+\ 1\ 0\ 1_{two}$

Subtract

1. $1\ 1\ 1_{two}$ $-\ 1\ 0_{two}$
2. $1\ 1\ 1\ 1\ 1_{two}$ $-\ 1\ 0\ 1_{two}$
3. $1\ 1\ 1\ 1_{two}$ $-1\ 0\ 1\ 0_{two}$
4. $1\ 1\ 1\ 0\ 1_{two}$ $-\ 1\ 0\ 0\ 1_{two}$

5. The number of people who washed their hands with a sanitizer were 11101two on Monday and 1001two on Tuesday. How many did the washing on the two days? Give your answer in base two.

Activity

Draw an abacus with 5 spikes in base 2 and label the place value.

MULTIPLICATION OF NUMBERS IN BASE TWO.

Materials needed

Pen, a book, a ruler counters of any kind from the environment

INTRODUCTION

Multiplication of numbers in base two is done normally like in base ten. But when adding and the sum is more than 1 divide and regroup to another place value.

111_{two}

$\times\ 11_{two}$

111

+1110

10101_{two}

Explanation of the procedure followed.
Ones: 1 x 1 = 1
Twos: 1 x 1 = 1
Two twos: 1 x 1 = 1
This is repeated for the second value.

Add ones 1 + 0 = 1

Add twos 1 + 1 = 2 but 2 ÷ 2 = 1 rem 0

Add Two twos 1 + 1 + 1 = 3 but 3 ÷ 2 = 1 r 1

Add Two twos twos 1 + 1 = 2 but 2 ÷ 2 = 1 r 0.

Exercise

1. $10_{two} \times 10_{two}$
2. $101_{two} \times 10_{two}$
3. $11_{two} \times 11_{two}$
4. $101_{two} \times 11_{two}$
5. $1011_{two} \times 10_{two}$
6. $111_{two} \times 100_{two}$

CHANGING NON-DECIMAL BASE NUMBERS TO BASE TEN AND VICE VERSA.

INTRODUCTION

Move around you compound and collect 50 stones or sticks 50. Make groups of 8 stones. How many groups have you made? The number of groups is accompanied with by the remainder. The answer gives you the equivalent of 50 in base ten to base eight. Today you are going to learn changing numbers from base ten to other bases and vice versa.

When changing numbers from base ten to other bases, you divide the numeral in base ten by the number of the base you want to change to.

You record the remainders starting from the one you wrote last.

For example, let us convert 155_{ten} to base six

We divide 155 by 6

155 ÷ 6 = 25 rem 5

Divide 25 by 6 25 ÷ 6 = 4 rem 1

Since 4 is less than 6, we can stop there and write our answer starting with 4 backwards to get 415_{six}

Therefore, $155_{ten} = 415_{six}$

Changing numbers to base ten.

When changing other base numerals to base ten, we need to consider the place values of the given digits in that numeral. This is similar to what we have already done by changing numbers from base two to base ten.

Let us start by changing 214_{seven} to base ten.

Draw a place value table for 214_{seven}

Seven sevens	Sevens	Ones
2	1	4

2 x (Seven Sevens) + 1 x (Sevens) + 4 x (Ones)

2 x 7 x 7 + 1 x 7 + 4 x 1

2 x 49 + 1 x 7 + 4 x 1

98 + 7 + 4

109

We multiply the digit with its respective place value then add to get the equivalent of that numeral in base ten.

EXERCISE

Change the following to base ten

1. 43_{five}
2. 314_{five}
3. 2301_{five}
4. 314_{eight}
5. 2012_{five}
6. 155_{six}

Change the following as instructed

1. 57_{ten} to base five
2. 142_{ten} to base six
3. 221_{ten} to base three
4. 137_{ten} to base eight
5. 98_{ten} to base four
6. 72_{ten} to base five

ROMAN NUMERALS

Materials needed

pen, book, wall clock

INTODUCTION

In primary six, we learnt about Roman Numerals. We were able to write numbers in Roman numerals. In this section, we shall add on to what we learnt and convert Roman numbers to the Hindu -Arabic system and vice versa.

The Roman numerals uses 7 letters. These are I, V, X, L, C, D, M

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

We keep changing the order of these seven letters to get other values in Roman numerals. When a letter is repeated more than once, it is added. e.g cc =100 + 100 = 200 where a small letter comes after a larger letter, its value is added. For example LX = 50 + 10 = 60

When a small letter comes before a large letter, it's value is subtracted CM=1000 – 100 = 900. A single letter cannot be written more than 3 times. E.g 400 is written as CD not CCCC.

Converting from Roman Numerals to Hindu Arabic numerals:

When changing from Roman numerals to Hindu Arabic numerals, it is advisable you first separate the Roman numeral letters and then add later.

Examples

Convert LXX to Hindu Arabic numerals

LXX = L + XX

= 50 + 20

= 70.

Convert MCMXLII to Hindu Arabic numerals

MCMXLII = M + CM + XL + II

= 1000 + 900 + 40 + 2

= 1942.

Write 287 in Roman numerals

200 + 80 + 7

CC + LXXX + VII

CCLXXXVII

Exercise

Change the following Roman numerals to Hindu Arabic numerals.

1. XXXIV
2. XCVIII
3. CMLXX
4. MDLIX
5. CMLXXII
6. XLIX

Change the following numbers to Roman numbers

1. 92
2. 273
3. 547
4. 1278
5. 1999

6. Uganda discovered the first victim of COVID 19 on XVIII –III-MMXX. Write the date in Arabic numerals.

Activity

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The numbers in the circles represent the positions of the letters of alphabet. Find the corresponding letters to the circles and hence find the sum in Roman numerals

(24) (4) (12) (22) + (3) (4)

OPERATIONS ON WHOLE NUMBERS INTRODUCTION

In primary six, you did operations on whole numbers. You multiplied numbers, added, wrote numbers in expanded form, learnt about place values and many more. Now that you are Primary Seven, you will be doing much more and working with bigger numbers as well.

MULTIPLYING WHOLE NUMBERS BY 3 DIGIT NUMBERS

When multiplying numbers, first expand the small number which is being multiplied by the big one according to values. Multiply each of the value by big number and then add up all the products in order to get the final answer.

For example, evaluate 34526 x 247

Expanding 247 = 200 + 40 + 7

Multiply 34526 by 200

```
  34526
x   200
-------
  00000
 000000
+ 6905200
-------
  6,905,200
```

Multiply 34526by 40

```
  34526
x    40
-------
  00000
+ 1,381,040
-------
  1,381,040
```

Multiply 34526 by 7

```
  34526
x     7
-------
241,682
```

Step 2 Add all the products

```
  6,905,200
  1,381,040
+   241,682
-----------
  8,527,922
```

The total gives us the product of 34526 and 247.

Exercise

1. 2314 x 859
2. 6543 x 412
3. 3614 x 215
4. A bicycle costs sh.257,500. How much do 214bicycles cost?
5. There are 14500 villages in U.S.A. If there are 425 victims of COVID 19 in each village, how many nails are there?

Activity

Look around your home you could be having some goats, cows and hens or ducks. Get a pen and record the number of each category. What is their total number of legs?

DIVISION OF WHOLE NUMBERS BY 3 DIGIT NUMBERS

MATERIALS NEEDED

Pen, a box, a ruler, some counters of any sort

Mr. Ouma has sh. 1,575,000 and wants to buy desks which cost sh. 45,000. How many desks will he be able to get? To solve this challenge, Mr. Ouma will need to know how many times sh. 45,000 is contained in sh. 1,575,000. Hence he has to divide. So in this lesson we are going to look at division of whole numbers.

Example 1: 4298400 ÷ 120

```
                35820
          120 | 4298400
3 x 120     -   360
              ------
              698
5 x 120     -   600
              ------
              984
            -  960
              ------
8 x 120       240
2 x 120     -  240
              ------
```

Example 2:

112 chairs cost sh. 41936048 altogether. How much does one chair cost?

To get the cost of one chair, one has to divide sh. 41936048 by 112.

Let us start by listing down the multiples of 112

112, 224, 336, 448, 560, 672, 784, 896, 1008

```
      374429
112 | 41936048
     - 336        Check from the multiples
       ---
       833        Check from the list the pc
     - 784        Check for 480
       ---
       496        Check for 480
     - 448        Check for 324
       ---
       480
     - 448        Check for 1008
       ---
       324
     - 224
       ---
       1008
     - 1008
       ----
```

Exercise

1. 6299514 ÷ 234
2. 5,737,500 ÷ 450
3. 9,053,352 ÷ 322
4. Pauline sold eggs from father's poultry farm and earned sh. 2812500. If there were 450 trays sold, how much was each tray.
5. A fashion designer was paid sh. 5,891,875 for 625 dresses. How much money does each dress cost?

Activity:

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Get 20 litres of water, mixed it with 5 litres of waragi to make sanitize for 5 doors. How many litres of sanitizer does each door get?

EXPANDING NUMBERS USING EXPONENTS

INTRODUCTION

Scientists use a scale that registers the strength of the earth quakes. The scale increases in power of ten. The register of 2.0 is ten times the register of 1.0 and that of 3.0 is 100times that 1.0. In this lesson we are going to look at powers of ten.

Count the number of notes you can use to buy a sanitizer of sh. 78,560

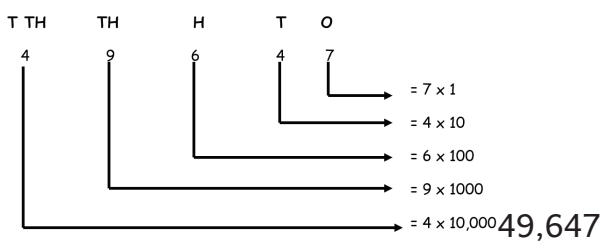
Money	Number of notes	Total value
10,000	7	Sh. 70,000
1,000	8	Sh. 8,000
100	5	Sh. 500
10	6	Sh. 60
1	__	

To expand numbers one needs to find the value of each digit in the number by using powers of ten. Sometimes we can use exponents to expand numbers.

Below is a table for exponents (powers of ten)

Number	Exponent (power)	You read as
10	$10 = 10^1$	10 exponent 1
100	$10 \times 10 = 10^2$	10 exponent 2
1000	$10 \times 10 \times 10 = 10^3$	10 exponent 3
10000	$10 \times 10 \times 10 \times 10 = 10^4$	10 exponent 4

Expand 49,647



49,647

= 4 x 10,000 + 9 x 1000 + 6 x 100 + 4 x 10 + 7 x 1

= $4 \times 10^4 + 9 \times 10^3 + 6 \times 10^2 + 4 \times 10^1 + 7 \times 10^0$

What number has been expanded?

$(7 \times 10^5) + (8 \times 10^4) + (3 \times 10^2) + (2 \times 10^1)$

= $(7 \times 100000) + (8 \times 10000) + 300 \times 100) + (2 \times 10)$

=700,000 + 80,000 + 300 + 20

= 780,320

Exercise:

Now that you have done expansion, you can try these numbers.

Expand;

1. 972
2. 7924
3. 36516
4. 79264
5. 47256497

What number has been expanded to give?

1. $(4 \times 10^4) + (2 \times 10^3) + (9 \times 10^1) + 1 \times 10^1) + (7 \times 10^0)$
2. $(3 \times 10^3) + (6 \times 10^2) + (5 \times 10^1) + (0 \times 10^0)$
3. $(6 \times 10^4) + (2 \times 10^3) + (6 \times 10^2) + (8 \times 10^1) + (3 \times 10^0)$
4. $(7 \times 10^4) + (2 \times 10^3) + (6 \times 10^2) + (8 \times 10^1) + (3 \times 10^0)$

EXPANDED FORM USING INDICES INTRODUCTION

You have covered something to do with square numbers in P.6 e.g

i) $1=1^2$ iii) $9 = 3^2$

ii) $4 =2^2$ iv) $16 = 4^2$

An index tells us how many times you have to multiply a number by itself. It is always written at the top right of the number. An index is sometimes called a (power). The number to which you write an index is called the base.

$2 \times 2 \times 2 \times 2 \times 2 = 2^5 = 3\ 2$

Index

base

Reading of indices

We read power of 2 as squared e.g 3^2 is three squared

The Power of 3 is read as cubed e.g 4^3 is four cubed

Some simple rules to follow

Rule 1: When you multiplying numbers of the same base, we add the power only. For example

$4^3 \times 4^3 = 4^{3+2}$

$= 4^5$

Rule 2: A number written without any power has power 1.

$2 = 2^1$

$5 = 5^1$

Examples:

1) Find the value of: 8^3

The base is 8 and the index is 3 so, multiply 8 by itself 3 times 8 x 8 x 8 = 512

2) Simplify 7 x 7 x 7 x 7
In this question, the base is 7 and it is being multiplied by itself 4 times so 7 x 7 x 7 x 7 = 7^4

Exercise:

Find the value of:

1. 5^4
2. 6^3
3. 4^4
4. 3^3

Simplify:

1. 3 x 3 x 3 x 3 x 3
2. 6 x 6 x 6
3. 9 x 9 x 9 x 9
4. $4^6 \times 4^2$
5. $2^4 \times 2^7$
6. $5^{10}\ 5^3$
7. $7^0 \times 7^{10}$

Activity

1. Suppose that X represents the number of times you entered 3 as a factor. Find the value of x that makes the statement true $3^x=27$.
2. Write COVID-19 in full

STANDARD FORM (SCIENTIFIC NOTATION)

INTRODUCTION

Imagine you are asked to write down the distance from the Earth to the sun how would you feel? There are about 60,000,000 people in Uganda. These are large numbers. So in this lesson we shall learn how to write big numbers in

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standard form. Standard form allows us to express a very small or very large number in a compact form.

Examples

Write 19,000,000 in standard form.

Write 19,000,000 is the same as 19 million

So 19m = 19 x 10^6

But 19 = 1.9 x 10

So 19m = 1.9 x 10 x 10^6

= 1.9 x 10^7

1.9 x 10^7 is the standard form of 19,000,000. It is also sometimes called scientific notation.

What you need to know about standard form

1. It takes the form A.B x 10^n
2. Where A and B and numbers from 1 to 9.
3. n is the power of ten. n can be positive or negative number.

Example 2

Write 48,000,000 in standard form

This is the same as 48million.

Express 48m as a product of powers of 10
48 x 10^6

Write the expression 48 x 10^6 in form of (A.B x 10^n)

=4.8 x 10 x 10^6

=4.8 x 10^7

So you have written 48,000,000 in standard form as 4.8 x 10^7

Exercise:

Write the following in standard form

1.	456	4.	30,657,000
2.	7464	5.	2,163,423
3.	87,000,000	6.	89,500,006

Activity

Write the number represented by 9.3 x 10^4. What is the relationship between the power of 10 and the number of places the decimal point in 9.3 is moved to the right?

PRIME FACTORIZATION

INTODUCTION

In Primary six you learnt about types of numbers do you remember some? Get out your book to remind you if you have forgotten. In this lesson, we shall be making use of prime numbers. Prime factorization is aimed at writing any number as a product of its prime factors.

Remind yourself the following

i) A prime number is a number that has only two factors. 1 and itself. Examples of prime numbers are 2, 3, 5, 7, 11, ...
ii) A factor is a number that divides into another number exactly without leaving a remainder. For example, 8 ÷ 2 = 4; 8 ÷ 4 = 2; 8 ÷ 2 = 4, 8 ÷ 1 = 8. In these three examples, the factors of 8 are 2, 4 and 8. 8 ÷ 3 = 2 rem2. In this case 3 is not a factor of 8.

Examples

Express 36 as a product of its prime factors.

To do this question, we are going to apply a number of skills we learnt in primary six. These are;

i) Knowledge of prime numbers
ii) Use of divisibility rules
iii) And expressing a number in power form.

Solution

The smallest prime number is 2 and 36 is divisible by 2

36 ÷ 2 = 18.

Since 18 is also divisible by two, we shall continue to divide until we cannot divide it any further.

18 ÷ 2 = 9.

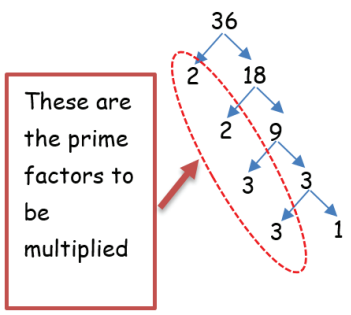
9 is not divisible by 2. The next prime number is 3 and 9 is divisible by 3. We shall continue dividing but this time using any prime number that is a factor of the number we have.

9 ÷ 3 = 3.

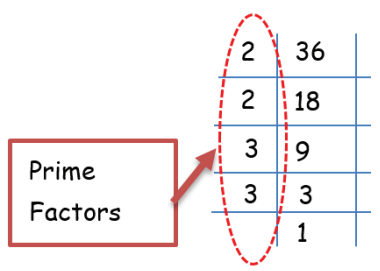
3 ÷ 3 = 1

To express 36 as a product of its prime factors we multiply all the factors we have used. Make sure is a factor has been used more than once, it is multiplied for the same number of times. We shall have 36 = 2x2x3x3 = 2^2 x 3^2

Let us do the same question using an alternative approach with minimum explanation.



OR



Therefore 36 = 2x2x3x3 = 2^2 x 3^2. This is the same as Prime factorization.

Exercise

1. Prime factorize the following and write the prime factors in multiplication form.

(i)	72	(ii)	56
(iii)	48	(iv)	24

2. Prime factorize the following and write the prime factors in power form

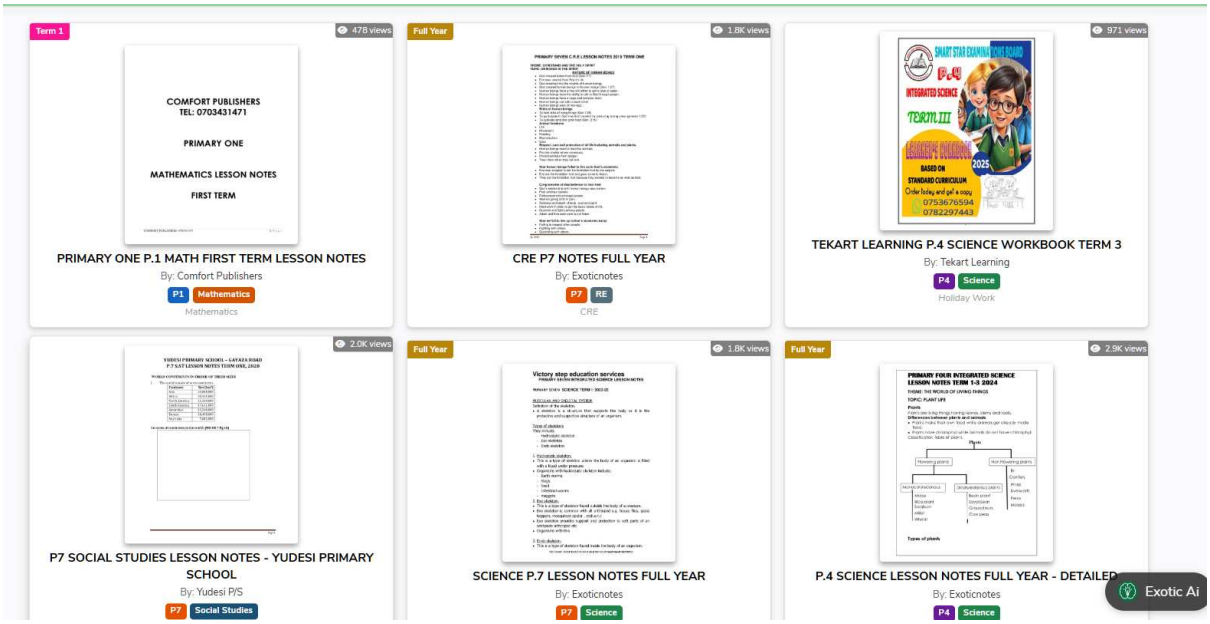
(i)	60	(ii)	100
(iii)	90	(iv)	140
(v)	24	(vi)	180
(vii)	210	(viii)	200

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