**LIFEBRIDGE INTEGRATED LEARNING CENTRE**

**GEOGRAPHY GRADE 12 TERM 1**

**CLIMATOLOGY**

**INTRODUCTION**

Welcome to the first section of your grade 12 year course, Climatology! I hope you find this part of the course interesting and useful. It is also quite bit of hard work because there are some complicated concepts and processes that you will master and some new terms you must learn, but I am sure you will also have some fun especially when we look at some of the case studies and videos of extreme weather events.

This brief note aims to give you an overview of everything we will learn in this section and provide a sort of road map to help you stay focused. Let’s go y starting with a quick recap of some important things you learned last year in grade 11.

**REVIEW OF WHAT YOU KNOW**

1. Geographers and meteorologists use a few basic scientific principles when studying weather:

**OBSERVING**

(Measuring, recording)

Using weather station instruments

Satellite image information.

**APPLYING**

(making predictions, managing effects).

How weather patterns affect us.

Managing extreme weather events to reduce harm.

Climate change

**ORGANIZING**

(tables, graphs, maps or charts, classifying and naming.)

Cloud formations

Synoptic chart.

**INTERPRETING**

(Trends, patterns and systems;

links, causes and effects.)

1. In grade 11 you learned how the earth’s energy systems in the atmosphere affected climate and weather. The two most important sources of energy are:
2. The radiation and heat energy from the sun (called \_\_\_\_\_\_\_\_\_\_\_\_\_) and
3. Kinetic energy produced by the movement of the earth in space.

The earth moves in the following ways with the resulting effects (Discuss in class and complete the table)

|  |  |
| --- | --- |
| **Type of movement** | **Impact and effect** |
|  | Distance from sun |
| Changes in heat intensity |
| Seasonal temperature variation |
| Rotation on its own axis |  |
|  |
|  |
|  | Differences in amount of sunlight between northern and southern hemispheres |
|  |
|  |

1. Changes in temperature and sea currents produce changes in atmospheric pressure resulting in wind patterns and rainfall patterns. There are zones of low and high pressure at certain latitudes. Indicate on the globe below what type of pressure is found at each of the various latitudes ad o the right what wind cell is operating

00North Pole

High Polar cell

300N

600N

00 Equator

600S

300S

Low

00South Pole

1. When atmospheric pressure, heat, humidity, wind and other factors operate in a particular combined way it can produce a fairly predictable result in the weather. We can thus talk about **weather systems**.
2. Wind moves from high to low pressure areas but it does not usually blow directly from north to south or south to north because of the way the earth is rotating on its axis. This called the **Coriolis effect** or the **Coriolis force** ad it deflects winds to the right in the \_\_\_\_\_\_\_\_\_\_\_\_\_ hemisphere ad to the \_\_\_\_\_\_\_ in the southern hemisphere.

**LEARNING OUTCOMES**

Broadly speaking, this term you will learn how to be able to do the following nine things:

1. Identify and describe the general characteristics of three major weather systems that influence the weather in South Africa.
2. Explain where these systems form and distinguish the conditions necessary for their formation and the stages of their development.
3. Describe the weather phenomena associated with each system.
4. Recognize and explain the appearance of each type of system on satellite images and synoptic charts.
5. Outline and explain some of the impacts and effects of tropical cyclones on human activities and the environment and propose some strategies to prepare for and manage these.
6. Explain how human and topographic factors can produce unusual microclimates,
7. Describe the characteristics and causes of two micro climates: valley climates and urban climates.
8. Discuss and apply insights to describe the influences of local climates on human activities
9. Examine and evaluate strategies for reducing the negative impact of human activity on climates.

**COURSE OVERVIEW**

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| **WHAT WE ARE GOING TO LEARN** | **WHY THIS IS WORTH LEARNING** | **HOW WILL WE APPROACH IT** |
| Module 1: Mid-latitude cyclones  U1: Characteristics, location and conditions  U2: Stages of development  U3: Linked weather conditions, satellite images and synoptic charts  U4: Case study  Module 2; Tropical cyclones  U1: Characteristics, location and conditions  U2: Stages of development  U3: Linked weather conditions, satellite images and synoptic charts  U4: Case study  Module 3: Subtropical anti-cyclones  U1: Location and characteristics of high-pressure cells around SA  U2: How anti-cyclonic air circulation around SA affects weather  U3: Associated travelling disturbances  U4: Satellite images and synoptic charts  Module 4: Valley climates  U1: Effect of slope ad micro-climate of valleys  U2: Development of specific features  U3: How this affects human activities  Module 5: Urban climates  U1: Why urban and rural climates differ  U2: Urban heat islands  U3: Case study of a heat wave | **God’s first mandate to man** (Gen 1:28), to subdue and rule over the earth i.e. to do science and technology responsibly.  Weather and climate **affect everybody** in positive and negative ways.  **Climate change** is becoming a very important political and economic issue because **our actions affect outcomes**.  We will learn or strengthen **skills that are useful** in many other areas such as:   * Observing and recording information * Drawing inferences from data * Interpreting patterns, symbols and other forms of information * Analyzing information * Applying theoretical knowledge to make practical decisions * Planning and structuring investigations | 1. Each module is divided into several units or sub-topics 2. Modules start with overview and introductory session 3. Units presented as a self-study slide presentation on the blog. 4. Next period meet with teacher for discussion and clarification of presentation. 5. Then an in-class assessment task about the unit. 6. You will also be required to keep a set of daily weather observation records based on the weather station readings. 7. At the end of the module there will be a mini-test or task and a review and feedback session. 8. At the end of the course, you will write a portfolio test |

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| --- | --- | --- | --- |
| **WHAT RESOURCES WE CAN USE TO LEARN?** | **WHEN WILL THIS HAPPEN? (WORK PLAN)** | | **HOW WILL WE ASSESS LEARNING?** |
| 1. Textbook for reference:   Cohen, S., Fleming, B., Jay, P., Kroll, L., Ranby, P., Saunders, J., and C.D. van der Merwe (2013) *Platinum Geography Learners Book Grade 12.* Cape Town. Maskew Miller Longman.  (Also available on the blog.)   1. Blog for notes and presentations   https://www.lifebridgeschool.co.za   1. Revision materials   <http://www.eccurriculum.co.za/>FET%20vanaf%20Junie%  202020/12/Study\_\_Master\_Gr12\_Geography\_Climate\_and  \_weather.pdf | Jan 20-22 | Introduction, review of grade 11 work and view video | 1. Informal, formative assessment after each unit (mini-tests or tasks done in class.) 2. Each module assessed with formal task sheet. Count towards term mark 3. Formal portfolio test at end of term on entire course. 4. Questions in preliminary examinations P1 and 2. |
| 25-29 . | M1 U 1-3 |
| Feb 1-5 | M1 U 4; M2 U 1 M1 task |
| 8-12 | M 2 U 2-4 |
| 15-19 | M 2 Task M3 U 1-2 |
| 22- 26 | M 3 U 3-4 |
| Mar 1- 5 | M 3 task M 4 U 1-2 |
| 8-12 | M 4 U3 M 4 task M5 U1 |
| 15 -19 | M 5 U 2-3 M5 task |
| 22- 26 | Review and portfolio test |