

LESSON 13: AERIAL PHOTOGRAPHS

Key Concepts

In this lesson we will focus on summarising what you need to know about:

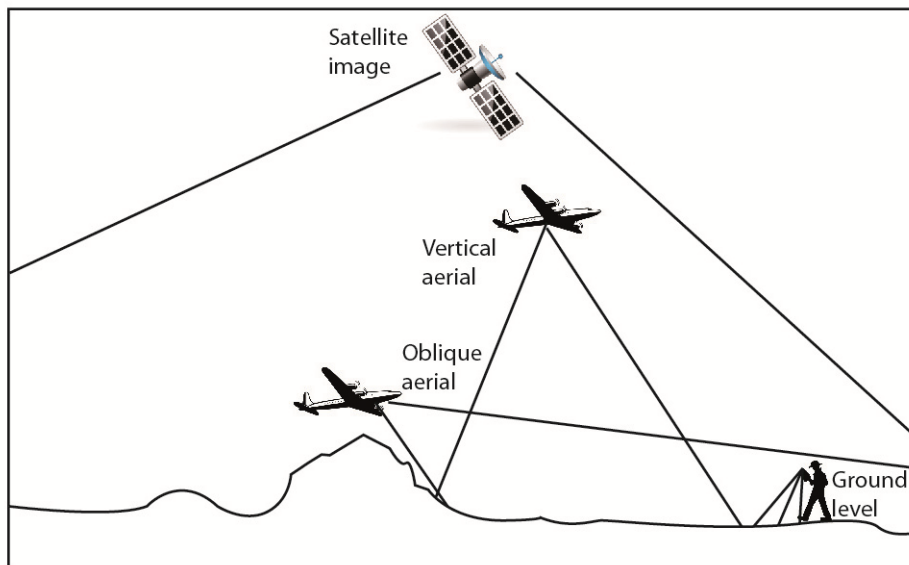
- Oblique and vertical aerial photographs – identifying landforms and features
- Use of tone, texture and shadow in interpretation
- Orthophoto maps – identifying features
- Orientating aerial photographs and orthophoto maps to topographic maps

X-planation

Introduction

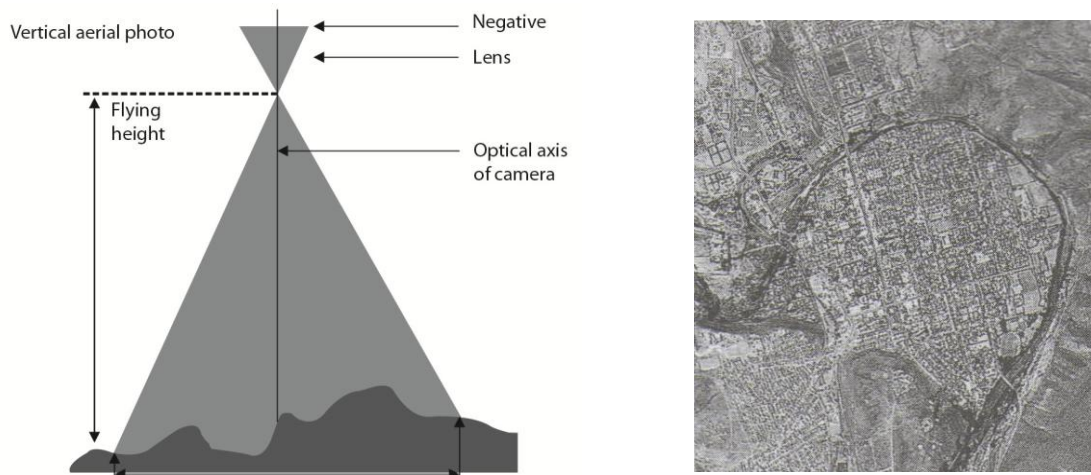
We must remember that aerial photographs are pictures of reality. Since we were babies we were looking at photographs. The best camera we have is our eyes. This experience that we have gained will assist us in understanding aerial photographs.

Types of Aerial Photographs



Vertical Aerial Photographs

Vertical aerial photographs are photographs that are taken directly from above by aircraft flying overhead (0° from the vertical). The best time to take these photographs is between 10:00 and 14:00 to minimise shadows on the photograph.



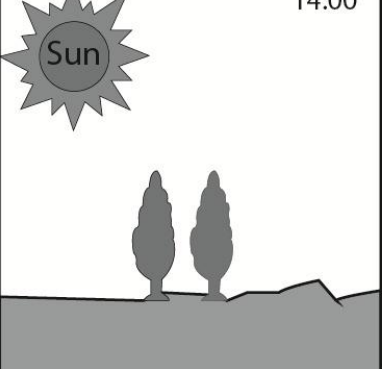
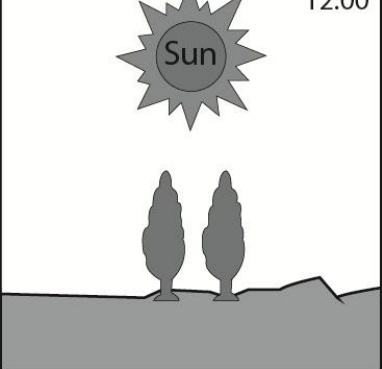
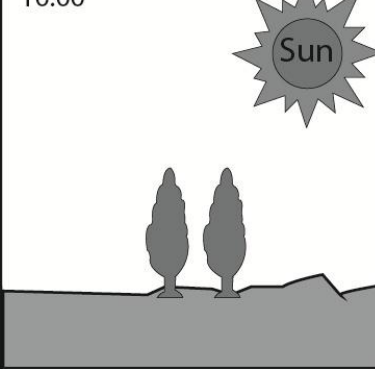
(Adapted from *In Search Of Mapwork Grade 10 – 12*)

The Advantages & Disadvantage of Vertical Aerial Photographs

| ADVANTAGES | DISADVANTAGES |
|---|---|
| <ul style="list-style-type: none"> • The scale is the same in all parts of the photograph • The shapes of objects are correct • Objects are not blocked. | <ul style="list-style-type: none"> • Detail is sometimes obscured by shadows • There is too much detail which makes it difficult to recognise small features. |

Take note:

Aerial photographs are taken between 10:00 and 14:00 to minimise the effect of shadows. Looking at the shadows can tell us at what time the photograph was taken

| 14:00 | 12:00 | 10:00 |
|--|---|---|
|  |  |  |
| <ul style="list-style-type: none"> • Shadow fall to the south east • Usually longer • Sun in the west | <ul style="list-style-type: none"> • Shadow fall due south • Shadow short • Sun overhead | <ul style="list-style-type: none"> • Shadows fall to south west • Usually longer • Sun in the east |

(Adapted from *Top Class Geography, Grade 11*)

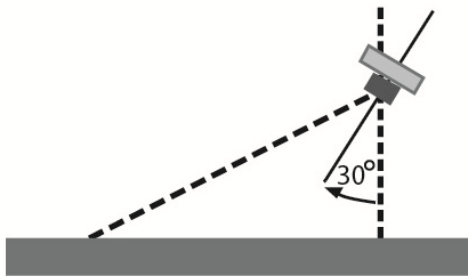
Oblique Aerial Photographs

Oblique aerial photograph is a view taken by a camera angled to the vertical.

Types of Oblique Aerial Photographs

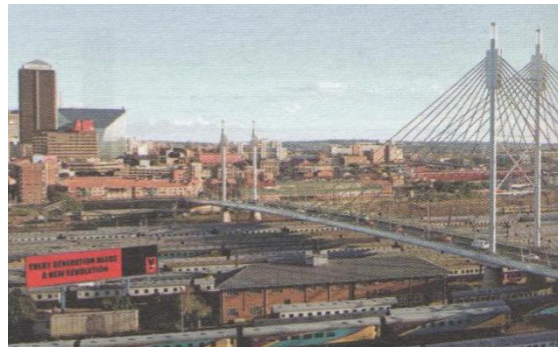
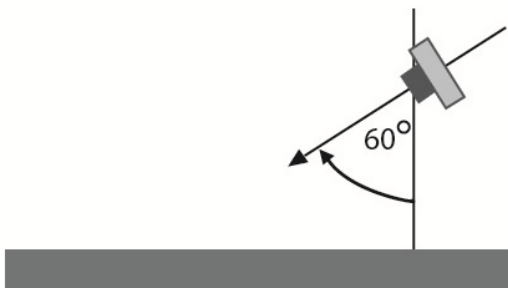
Low Angle Oblique Aerial Photographs

- The photograph below is taken with camera angled at 30° to the vertical.
- Low angle aerial photographs are taken further away from the ground and cover a smaller area but give you a clearer view of the area.



High Angle Oblique Aerial Photographs

- The photograph below is taken with camera angled at 60° to the vertical.
- High angle aerial photographs are taken closer to the ground and cover a larger area.



(Adapted from Spot on Geography, Grade 11)

The Advantages & Disadvantage of Oblique Aerial Photographs

| ADVANTAGES | DISADVANTAGES |
|--|---|
| <ul style="list-style-type: none">• They provide a more common view of the landscape (We can determine the relative height of various features). | <ul style="list-style-type: none">• The sizes of features are distorted.• We cannot apply a scale to the map due to the distortions.• Certain features are hidden by other features in front of them. |

Vertical Aerial Photograph Interpretation

Tone

- Refers to brightness or colour of a feature
- Light tones e.g. sand, concrete or roof tops
- Dark tones e.g. forests

Texture

- Refers to how coarse or smooth a feature is.
- Smooth texture e.g. grass or soccer field
- Rough texture e.g. forest

Shadows

- Shadows are cast by the sun's rays shining on object
- Shadows can give you an indication of the height and width of objects
- It can also tell you at what time the photograph was taken

Shape

- Shapes allow you to identify features
- Rectangular shape – buildings
- Rivers – long and width could vary. Roads – narrow and long

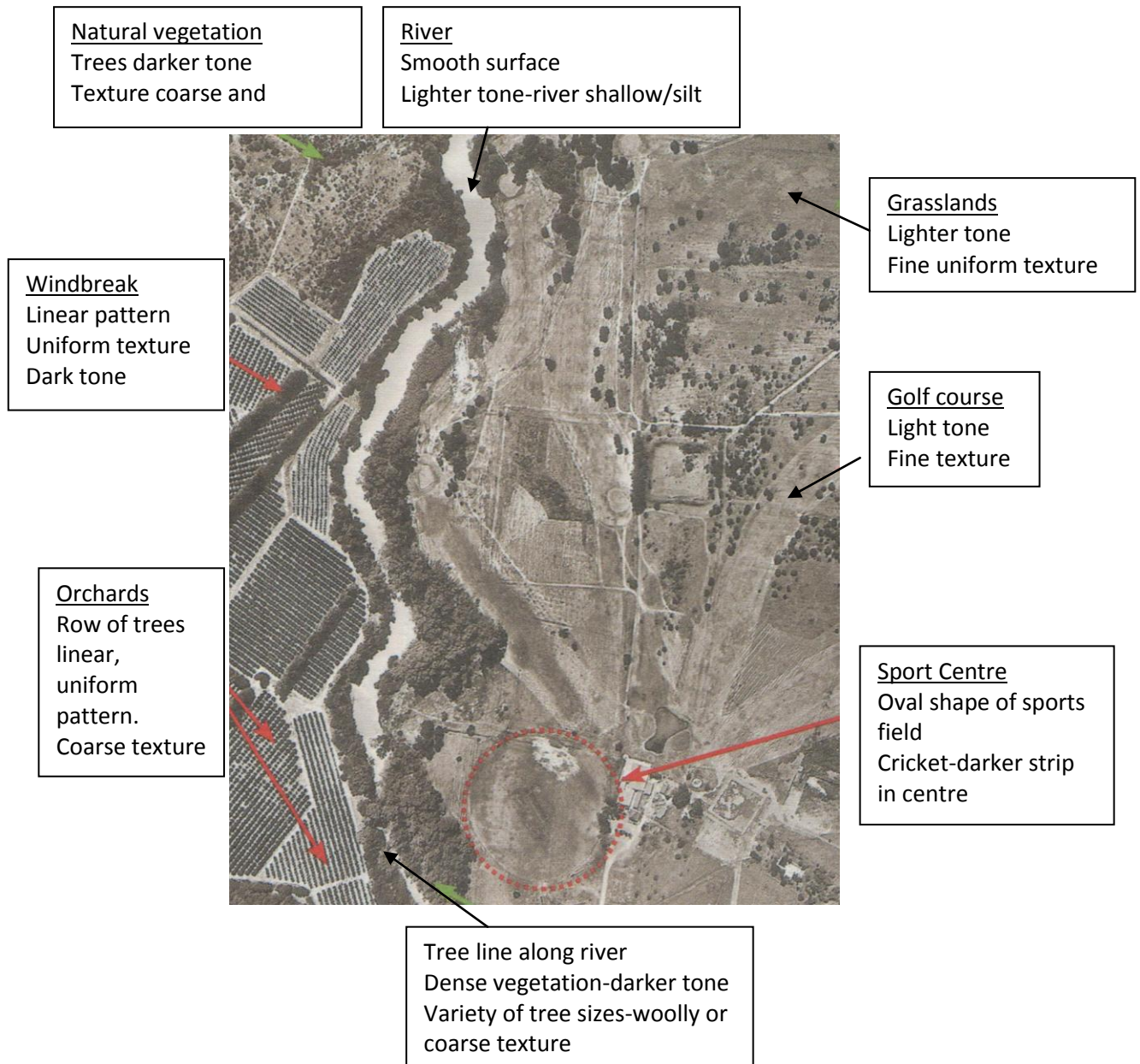
Size

- Big shape – industries, malls
- Small shapes – houses

Pattern

- Manmade feature – more regular patterns
- Natural features – more irregular patterns

Vertical Aerial Photograph Interpretation



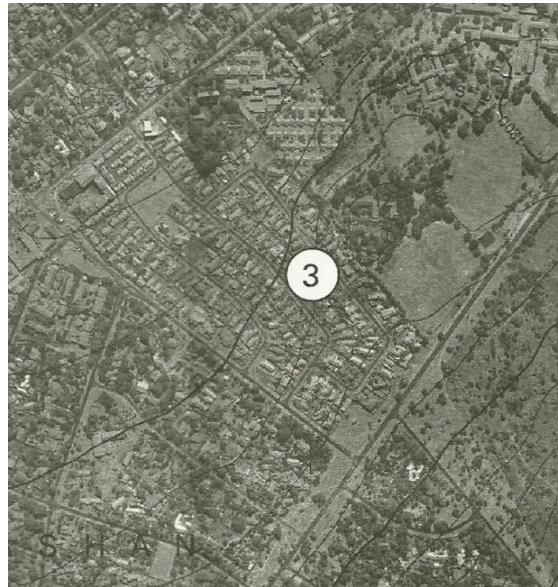
(Adapted from Top Class Geography Grade 11)



(Adapted from Focus Geography Grade 11)

Orthophoto Maps

- Orthophoto maps are a combination of a vertical aerial photograph and a topographical map.
- They are of great benefit because they are cheaper to produce and update than conventional maps, they have a bigger scale allowing for more detail and show more detail than of the landscape than topographic maps.
- When looking at tone, texture etc it is the same as vertical aerial photographs.



Map & Photo Orientation

Topographical maps will always differ and we need to ensure our orientation with regard to the map is as follows:

- Keep the map in a position where the title of the map is north/at the top.
- When orientating the Topographic map to the orthophoto/photo, find a feature that can be identified on the orthophoto/ photo and map e.g. - National route or large river.
- Align the feature on the map with the same feature on the photo. Orientation is important as it allows the learner to use both the map and the photo when answering questions in the exam.



X-ample Questions

Question 1

(Adapted from Platinum Geography Grade 11)

Study the photograph and map and answer the questions that follow:



- 1.1 List FOUR commercial functions of aerial photography.
- 1.2 Identify the features labelled A to E.
- 1.3 State TWO advantages of vertical aerial photographs.
- 1.4 State TWO Disadvantages of vertical aerial photographs

Question 2

(Adapted from Spot on Geography Grade 11)

Study the photographs and answer the questions that follow:

C



D



- 2.1 Explain the difference oblique aerial photographs and vertical aerial photographs.
- 2.2 State ONE disadvantage of oblique aerial photographs.
- 2.3 State THREE disadvantage of oblique aerial photographs.
- 2.4 State the type of oblique aerial photograph at C and D and identify the major feature found on the oblique aerial photographs

Question 3

(Adapted from Focus Geography Grade 11)

Study the photograph and map and answer the questions that follow:





3.1 What is the land use for in these areas?

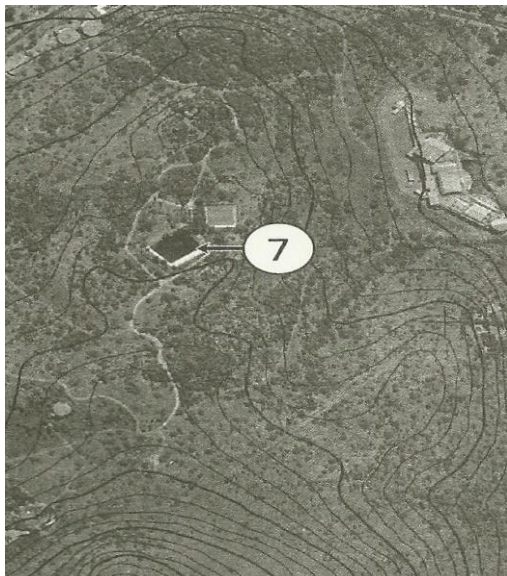
- 3.1.1 L11 and 12
- 3.1.2 P13 and 14
- 3.1.3 O11 and P11
- 3.1.4 E8
- 3.1.5 A10

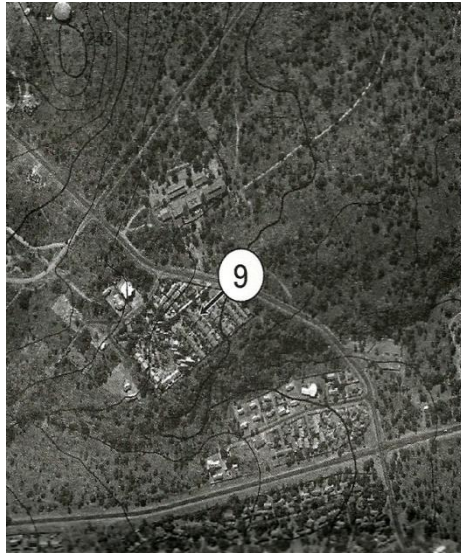
3.1.6 T3 and U3

- 3.2 How does the texture of the area in P13 and P14 indicate that this is not a wheat field or an orchard?
- 3.3 Arrange these buildings in order of height, starting with the tallest.
J15; I5; L11
- 3.4 Find the two rows (letters of the alphabet) that show the N2 national road.
- 3.5 What is the very dark area in parts of T7-10 and U7-10?
- 3.6 Squares H to M6-14 are the core of Knysna's central business district (CBD). Find two ways in which the CBD core looks different from a residential area
- 3.7 What is the transport function at R3 and R4?
- 3.8 Sport in Knysna. In which squares is there evidence of the following sport and recreation?
- 3.8.1 Tennis
 - 3.8.2 Rugby or soccer
 - 3.8.3 Cricket
 - 3.8.4 Sailing

Question 4

Refer to maps of Rustenburg West and the orthophotos below and answer the following questions:





4.1 Identify the following features on the orthophoto map:

- 7
- 9
- 12

4.2 Locate the area marked **3** on the orthophoto map.



4.3 This area is an informal settlement. Give ONE piece of evidence from the orthophoto map to support this statement.

X-ercise Questions

Question 1

(Adapted from Gr 11 Exemplar 2013, DBE, Paper 2, Question 3.7)

Refer to the orthophoto map.



1.1 What type of photograph is used to compile an orthophoto map?

(1 x 2) (2)

- 1.2 Give ONE advantage of using an orthophoto map. (1 x 2) (2)
- 1.3 Was the photograph used to compile the orthophoto map taken before or after midday (12:00). Give ONE reason for your answer. (2 x 2) (4)

Solutions to X-ercise Questions

Question 1

(Adapted from Gr 11 Exemplar 2013, DBE, Paper 2, Question 3.7)

- 1.1 Vertical aerial photograph
- 1.2 As features are shown on the photograph using map symbols one does not need a topographic map for interpretation
- 1.3 **Time:** Before midday
Reason: Shadows cast to southwest