

# Our Diverse Prairie Landscape: Saskatchewan is Not Just Flat!

## Lumsden – Qu’Appelle Valley Contour Maps

**Subject/Grade:** Earth Science 30

**Lesson Title:** Our Diverse Prairie Landscape: Lumsden - Qu’Appelle Valley Contour Maps

### Stage 1: Identify Desired Results

#### Outcome(s)/Indicator(s)

#### Earth Science 30

**ES30-LS1 Analyze surface geography as a product of weathering, erosion and mass wasting.**

(c) Explain how anomalous features of Saskatchewan such as Qu’Appelle Valley are characterized by specific depositional and erosional processes. (k)

(d) Describe the effects of mechanical weathering and erosion, including glaciation, on the surface geography of Saskatchewan. (k)

(h) Apply mapping techniques such as creating and interpreting topographic profiles and translating between 2-D surface maps/cross sections and 3D box diagrams to represent surface geographical features. (k)

#### **Key Understandings: ('I Can' statements)**

- I can interpret elevation contour lines on a 2D topographic map and understand the 3D topography.
- I can create a vertical profile from a contour map.
- I can explain how glaciation and weathering & erosion has shaped and continue to shape the topography of the Qu’Appelle Valley.

#### **Essential Questions:**

- What are contour lines?
- What are topographic maps used for? What does topographic mean?
- How has the landscape of the Qu’Appelle Valley been shaped and changed over time?
- What is currently shaping the topography of the Qu’Appelle Valley?

### Teacher Background

The Qu’Appelle Valley is an example of a steep-sided glacial meltwater Channel. It was formed during the last glaciation approximately 14,500 years ago (Storer, 1989). Currently the valley is being eroded and weathered down over time.

Possible resource for more information - <http://www.cmste.uregina.ca/valley/naturalhistory.html>

#### **Definitions**

**Topography:** the shape and features on the surface of the landscape.

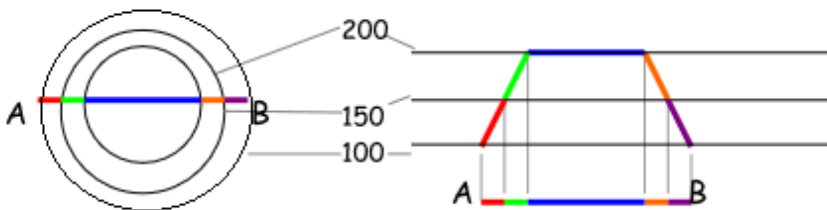
**Topographic Maps:** Show the shape and features on the surface of the landscape, often using elevation. Topographic maps are drawn to scale. The reduced scale is equal to the real scale.

**Contours:** are imaginary lines that connect all points of equal elevation. They are usually drawn every 50m or 100m on current maps. Older maps such as the Lumsden - Qu'Appelle map they are drawn every 25 or 50 feet.

### Stage 3: Build Learning Plan

**Set (Warm-up, Focusing the Learning):** Time: 10 min

Draw a bull's eye on the board. Extend a horizontal line through the bull's eye and draw a contour map.



**Development:**

Time: 40 min

**Introduction:**

Topographic maps- Contour lines connect all points of equal elevation. They are usually drawn every 50 or 100 m on current maps. On older maps such as the Lumsden – Qu' Appelle map they are drawn every 25 or 50 feet. Topographic maps are drawn to scale. The reduced scale is equal to the real scale.

**Activity:**

- Hand out sheets: Topographical Map of Lumsden – Qu'Appelle Valley question sheet, Lumsden - Qu' Appelle Valley Contour Map, Lumsden Contour Map Activity.
- Start with the Topographical question sheet. Students will work independently on sheets.
- When finished students can work on the Contour Map Assignment (the extension activity)  
Or students can research how the Qu'Appelle Valley was formed.  
Or the teacher can guide students through constructing a topographic cross section by using the contour only base map.

**Learning Closure:**

Time: 10 min

Finish off the lesson by asking students to summarize the big takeaways. Have an informal discussion on the lesson and let students ask questions.

**Materials/Equipment:**

- Handouts: Question sheet, Contour base map and Contour only map

**Safety Considerations:**

If you do the extension activity with bristol board and foam, make sure students are handling the scissors properly.

If you use a hot glue gun instead of regular glue, make sure students are using the hot glue gun properly. Keep the hot glue gun away from flammable materials. Set the hot glue gun on a surface that is not flammable. If a student burns themselves have them run the burn under cold water for a couple of minutes.

**Possible Adaptations/  
Differentiation**

The worksheet will not likely take the students the full period to complete, so have an activity (extension activity, or research activity or a different activity/video) that you want to do ready to go.

## Stage 4: Determine Evidence for Assessing Learning

- Students will create either a coloured version of the contour map using pencil crayons.
- Students will answer questions specific to the contour map.
- Formative - informal discussion on the big takeaways of the lesson and any questions that the students may have.

### Extensions

#### Materials for Extension:

- Bristol board (foam core for extra height)
- Scissors
- Glue

#### Extension Instructions - Contour Model

Using the contour only map, construct a relief map using Bristol board or foam core. This activity can be done in pairs. Using Bristol board or Foam Core:

\* Bristol board and foam core will be cut out to be the same size as the map.

1. Place the map on top of the Bristol Board. Make sure the corners are properly even
2. Starting with the lowest contour, trace over the contour line you are working on with a pencil. Press down hard with the pencil so as to leave a mark (indentation) on the Bristol board.
3. Trace over the mark with a pencil
4. Cut out the shape with scissors.
5. Trace and cut each of the other contour shapes in turn.
6. Glue the contour shapes into position. Begin with the lowest contour shape and work upward in order of height.
7. Once the shapes are in place draw in the details, such as rivers and creeks, so the model is more realistic.

Use pale blue as the base - <1625 **blue**

1625 - 1650 **dark green**

1650 - 1700 **pale green**

1700 - 1750 **yellow**

1750 - 1800 **orange**

1800 - 1850 **red**

>1850 **brown**

#### Extension

Look at the Digital Geological Highway Map of Saskatchewan (*GeoExplore Saskatchewan*) website for further information and a deeper understanding of the local context:

Main Website

<https://skgeolhighwaymap.maps.arcgis.com/apps/MapSeries/index.html?appid=a845cbb370f7401597806887318e2676>

For more background information related to this lesson check out

- Main tab "Landforms"
- Main tab "Ice Age"

## References

Department of Mines and Technical Surveys. Surveys and Mapping Branch, (1954). Lumsden Topographic Map 72 I 10 West Half. Scale 1:50,000

Melenchuk. A., (1997). Saskatchewan the land. Topic One, Activity 3. Science Directions. Toronto, ITP

Nelson. ISBN. 0-17-604994-0 (U. of R. Library)

Storer, J., 1989. Geological History of Saskatchewan.

Saskatchewan Museum of Natural History. Government of Saskatchewan.

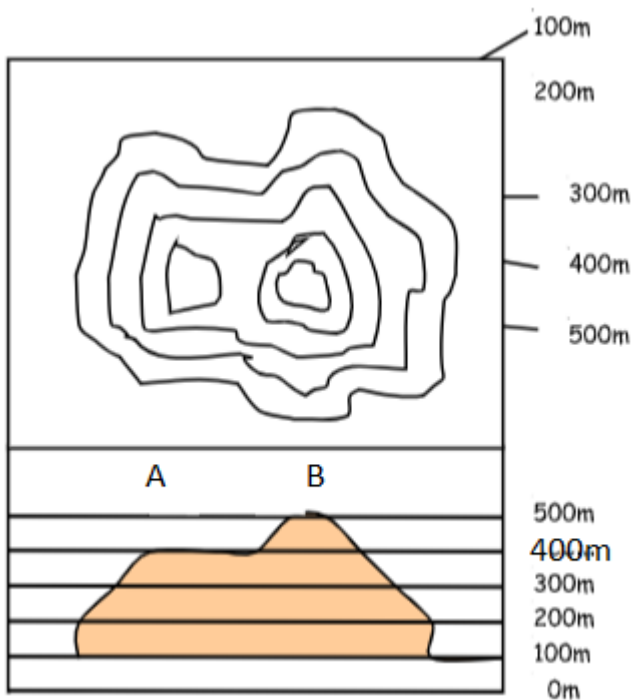
Name: \_\_\_\_\_

## Topographical Map of Lumsden - Qu' Appelle Valley

Lumsden is a town located in the Qu'Appelle Valley. When you look at the base map you will see contour lines that show the shape and the elevation of the land around the townsite. These lines are sometimes called "level lines" because they show points that are at the same level. The closer together the contour lines appear on a topographic map, the steeper the slope.

### How to read a topographic map

The top part of this drawing is a contour map which shows the hills illustrated below.



1. Which is higher, Hill A or Hill B?

\_\_\_\_\_

2. Which is steeper, Hill A or Hill B?

\_\_\_\_\_

3. How many meters of elevation are there between contour lines?

\_\_\_\_\_

4. How high is Hill A?

\_\_\_\_\_

5. How high is Hill B?

\_\_\_\_\_

### Look at the topographical map of Lumsden - Qu' Appelle Valley.

6. a) How many feet are there between each major contour line? \_\_\_\_\_ feet

b) How many meters would that be? \_\_\_\_\_ m

7. The gravel pit is between what two major contour lines?

\_\_\_\_\_ feet and \_\_\_\_\_ feet.

8. Which section of the Lumsden map shows the steepest slopes?

9. Would you be walking uphill or downhill to go from the Gravel Pit to the Water Tower?

### 10. Lumsden Contour Map Activity

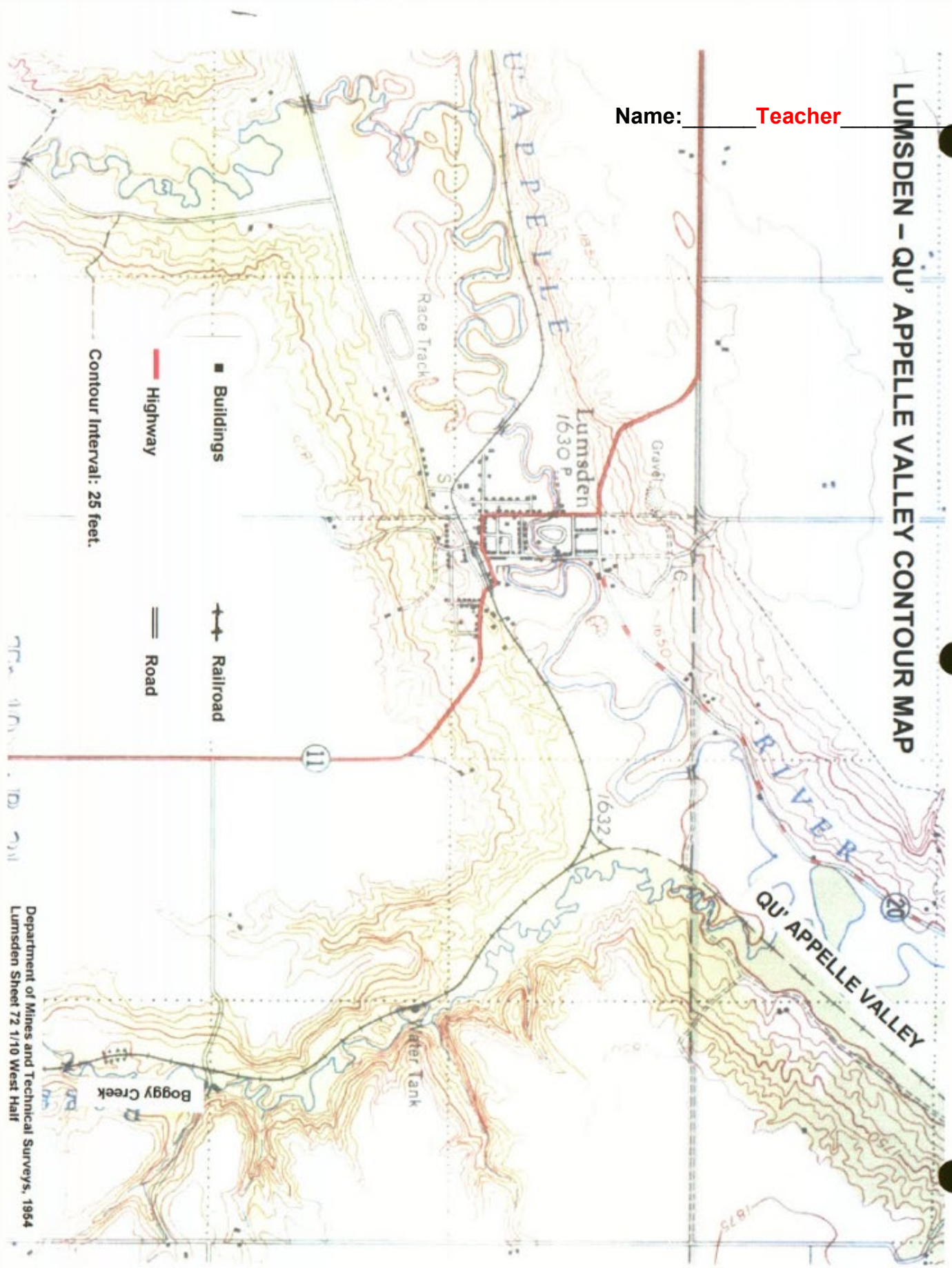
Using pencil crayons colour the map using these colours.

<1625	blue
1625 - 1650	dark green
1650 - 1700	pale green
1700 - 1750	yellow
1750 - 1800	orange
1800 - 1850	red
>1850	brown



# LUMSDEN - QU'APPELLE VALLEY CONTOUR MAP

Name: Teacher

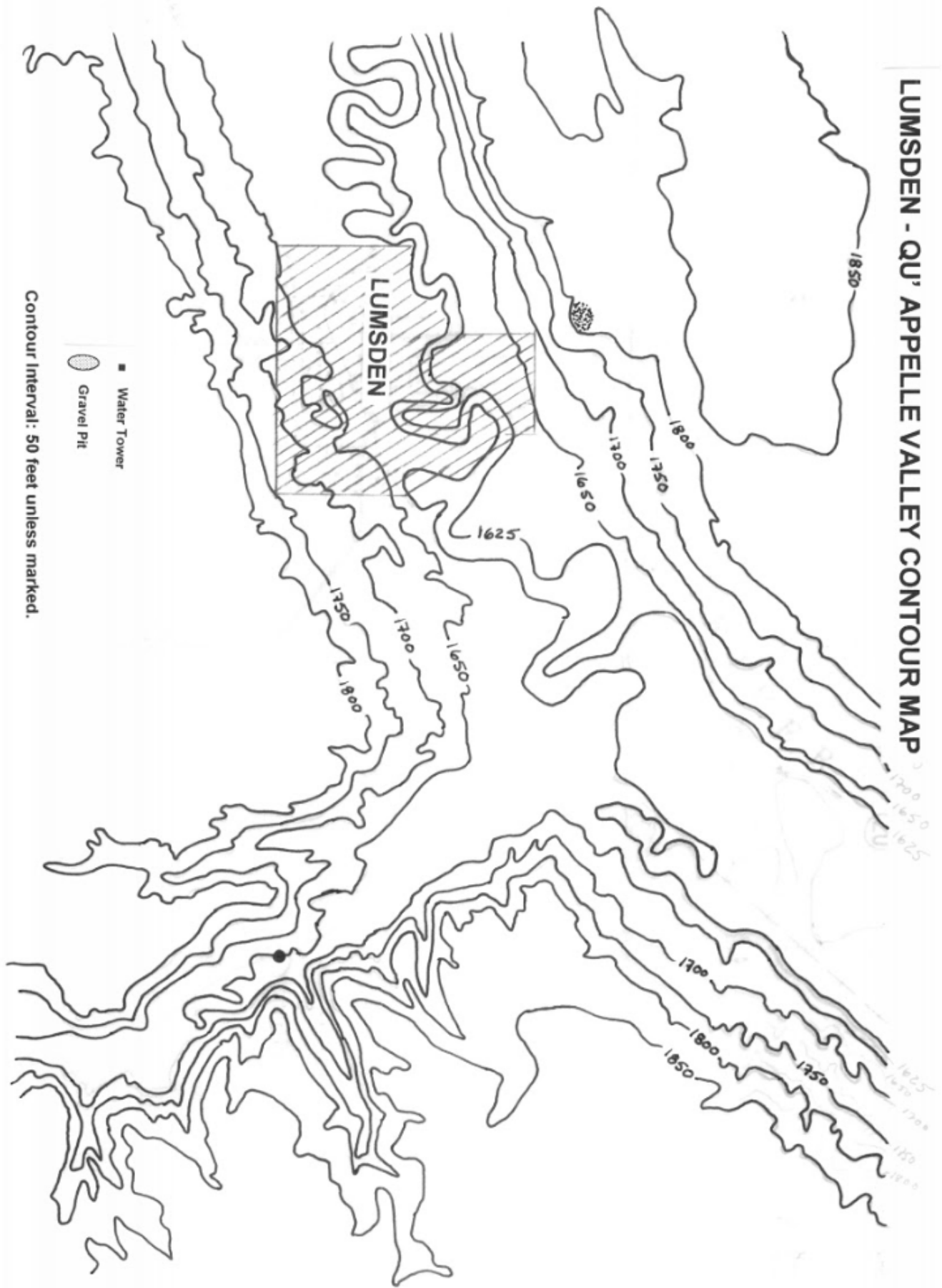


■ Buildings  
— Highway  
Contour Interval: 25 feet.

⚡ Railroad  
= Road

Department of Mines and Technical Surveys, 1964  
Lumsden Sheet 72 1/10 West Half

2  
2



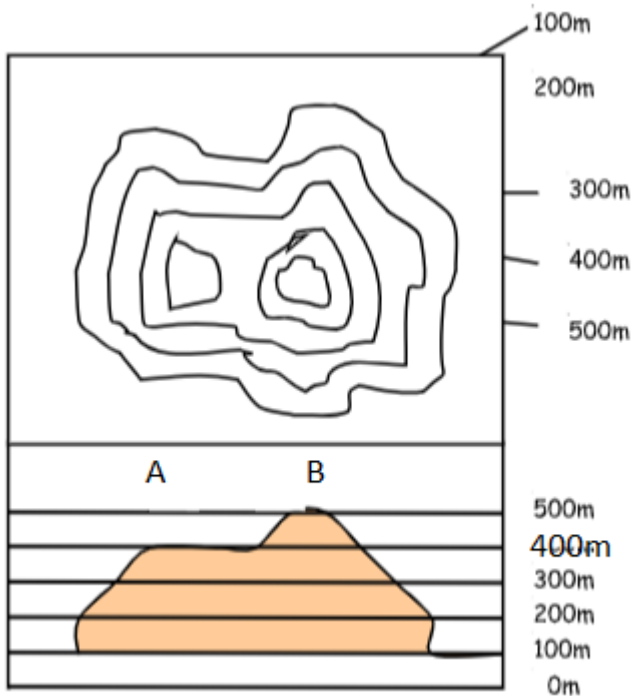


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### How to read a topographic map

The top part of this drawing is a contour map which shows the hills illustrated below.



1. Which is higher, Hill A or Hill B?

\_\_\_\_\_ Hill B \_\_\_\_\_

2. Which is steeper, Hill A or Hill B?

They are about the same

3. How many meters of elevation are there between contour lines?

\_\_\_\_\_ 100m \_\_\_\_\_

4. How high is Hill A?

\_\_\_\_\_ 400m \_\_\_\_\_

5. How high is Hill B?

\_\_\_\_\_ 500m \_\_\_\_\_

### Look at the topographical map of Lumsden - Qu' Appelle Valley.

6. a) How many feet are there between each major contour line? \_\_\_\_\_ 50 \_\_\_\_\_ feet

b) How many meters would that be? \_\_\_\_\_ 15.24 \_\_\_\_\_ m

7. The gravel pit is between what two major contour lines?

\_\_\_\_\_ 1800 \_\_\_\_\_ feet and \_\_\_\_\_ 1850 \_\_\_\_\_ feet.

8. Which area of the Lumsden map shows the steepest slopes?

The valley wall on the south side of the water tower.

9. Would you be walking uphill or downhill to go from the Gravel Pit to the Water Tower?

Geoscape Southern Saskatchewan: Geoscience for Prairie Communities.

Downhill overall, but if you go in a straight line you go down about 200 feet and then back up again about 50 feet.

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Using pencil crayons colour the map using these colours.

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