Lesson 1 Representing Relations and Interpreting/Sketching Graphs

Set: a collection of distinct objects

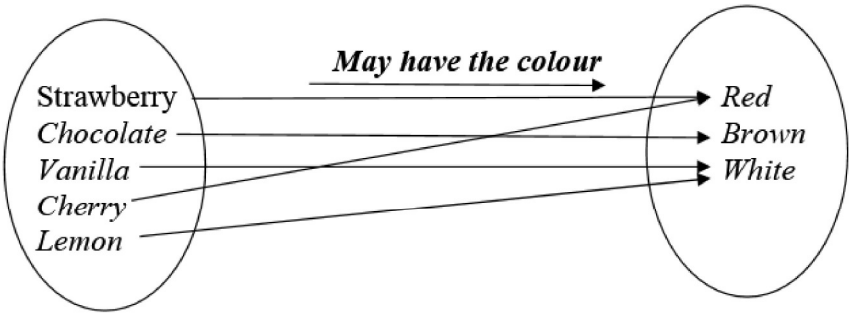
Element of a set: one of the objects in a set

Relation: associates the elements of one set with the elements of another set

Set of ice cream and set of colours

Strawberry	may have the colour	red
(element)	(association)	(element of second set)

Arrow Diagram (Mapping):



Read only **one** way. Can't read, "Red may have the colour strawberry"

Table:

Ice-cream	*Colour*
Strawberry	*Red*
Chocolate	*Brown*
Vanilla	*White*
Cherry	*Red*
Lemon	*White*

Ordered Pairs: { (strawberry, red), (chocolate, brown), (vanilla, white), (cherry, red), (lemon, white)}

Example 1: *Represent a relation given a table*

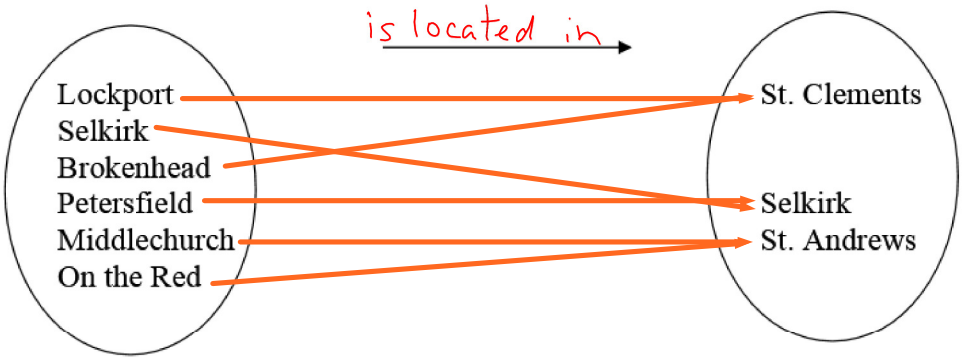
Community	Rural Municipality
Lockport	St. Clements
Selkirk	Selkirk
Brokenhead	St. Clements
Petersfield	Selkirk
Middlechurch	St. Andrews
On the Red	St. Andrews

Words: ex Lockport is located in the rural municipality of St. Clements

Ordered Pairs:

{(Lockport, St. Clements), (Selkirk, Selkirk), (Brokenhead, St. Clements), ...}

Arrow Diagram:

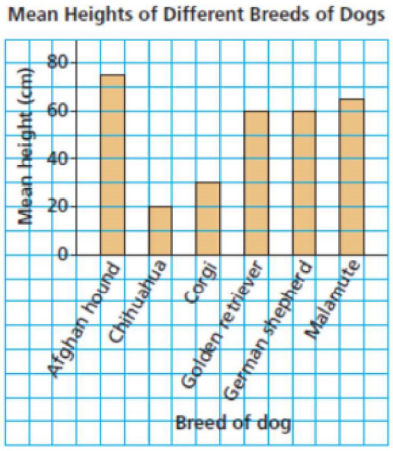


Example 2: *Represent a relation given a bar graph* (Pg. 260)

Different breeds of dogs can be associated with their mean heights. Consider the relation represented by this graph. Represent the relation:

a) as a table

b) as an arrow diagram

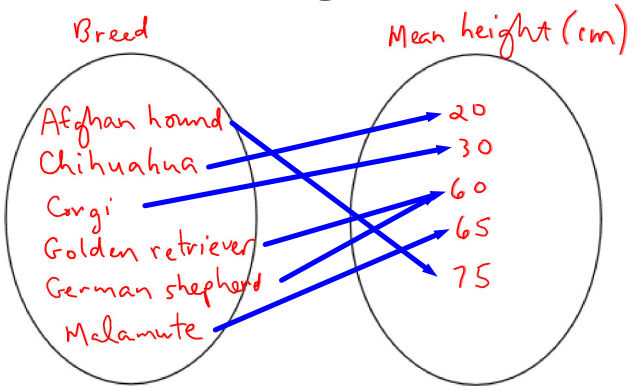


The association: The breed of dog may have a mean height of ___ cm

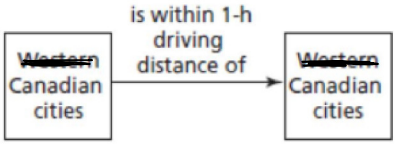
Table:

Breed of Dog	Mean Height (cm)
Afghan Hound	75
Chihuahua	20
Corgi	30
Golden retriever	60
German shepherd	60
Malamute	65

Arrow Diagram:



Example 3: *Identify a relation from a diagram*



a) Describe relation in words

Two canadian cities are within 1-h driving distance.

b) List 2 ordered pairs that belong to the relation

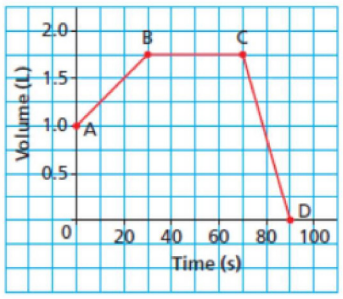
(Selkirk, Winnipeg)

(Winnipeg, Steinbach)

(Calgary, Airdrie)

Interpreting and Sketching Graphs

Example 1: *Describing a Possible Situation for a Graph*



At A
Watering can starts with 1 L of water in it.

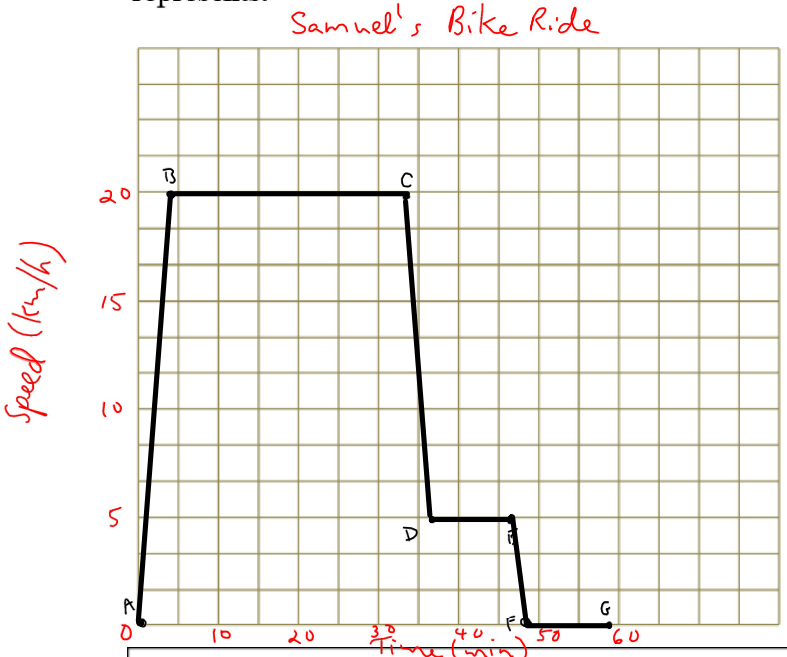
A→B
Watering can is being filled for 30 s to a volume of 1.75L

B→C
Volume remains constant while walking to the garden for 40s

C→D
Volume decreases to 0L (empty) while watering the plants for 20s

Example 2: *Sketching a Graph for a Given Situation*

Samuel went on a bicycle ride. He accelerated until he reached a speed of 20 km/h, then he cycled for 30 min at approximately 20 km/h. Samuel arrived at the bottom of a hill, and his speed decreased to approximately 5 km/h for 10 min as he cycled up the hill. He stopped at the top of the hill for 10 min. Sketch a graph of speed as a function of time. Label each section of the graph, and explain what it represents.



A→B
acceleration from 0→20km/h

B→C
cycles at 20km/h for 30 mins

C→D
speed decreases to 5km/h

D→E
constant speed 5km/h

E→F
slows to a stop

F→G
at top of the hill for 10 mins

Assignment: Pg. 262 #3a, 6, 8
Pg. 281 #6, 10, 13