**Math 20-2: U8L2 Teacher Notes**

**Solving Problems that Involve Rates**

**Key Math Learnings:**

**By the end of this lesson, you will learn the following concepts:**

* Interpret rates in a given context, such as the arts, commerce, the   
  environment, medicine or recreation.
* Solve a rate problem that requires the isolation of a variable.
* Determine and compare rates and unit rates.
* Make and justify a decision, using rates.
* Describe a context for a given rate or unit rate.
* Identify and explain factors that influence a rate in a given context.
* Solve a contextual problem that involves rates or unit rates.

**Strategies For Solving Rate Problems**

**When you are given a rate problem that involves an unknown, you can solve the**problem using a variety of strategies.

**1. Pair of equivalent ratios**

**To be equivalent ratios, the units in the numerators of the two ratios:**

**2. A Multiplication Strategy**

**Problems that require conversions between units:**

**3. Write a Linear function**

**When a Rate of Change is Constant:**

**Example**

Mario borrowed $1000 and paid $40 simple interest. If he borrowed the money for   
eight months, what interest rate was he charged?

**Example**

Describe a situation in which each rate might be used. Identify any factors that could influence the rate in this situation. -1.5 °C/km

**Example**

Describe a situation in which each rate might be used. Identify any factors that could influence the rate in this situation. $4.99 /ft2

**Example**

Melanie wants to defrost a frozen roast, which weighs 2.68 kg, in her   
microwave. To find out how much time she needs, she looks in a   
cookbook. She reads that 2 lb of meat takes 15 min to defrost. How   
long, to the nearest minute, should she set the timer for?

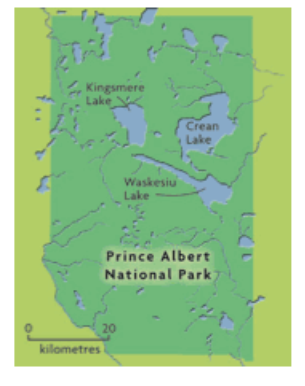
**Example**

Manpret has taken a job as a nurse in the community health centre in Tuktoyaktuk,   
Northwest Territories. She plans to ship her car, furniture, and personal effects to   
Tuktoyaktuk by barge from Vancouver. She has found these shipping rates online:

• light-duty vehicles: $0.2015/lb

• furniture and personal effects: $0.2734/lb

Manpret knows that her car has a mass of 1250 kg. She estimates that she has roughly   
550 lb of furniture and personal effects. Calculate her cost to ship these items to her   
destination.

**Example**

The map to the right shows Prince   
Albert National Park in   
Saskatchewan. The scale of the map   
is 1.3 cm to 20 km.

a) Estimate the area of the park in   
hectares. One hectare (1 ha) is   
equivalent to 10 000 m2.

b) The annual cost to monitor and   
fight forest fires in this region is about   
$48/ha. Estimate the annual fire   
management expenditure for the   
park.