

Illustrative Mathematics

N-Q Ice Cream Van

Alignments to Content Standards

- [Alignment: N-Q.A.1](#)

Tags

- *This task is not yet tagged.*

You are considering driving an ice cream van during the summer vacation. Your friend, who “knows everything” tells you that “It’s easy money.” You make a few inquiries and find that the van costs \$600 per week to rent. Each ice cream cone costs 50 cents to make and sells for \$1.50.

For each of the questions below, show all work and include an explanation of your method of solution.

- How many ice cream cones would you have to sell each week just to cover the cost of renting the van?
- In order to sell the ice cream cones, you have a choice of driving the van through neighborhoods or parking the van in a public area. Typical selling data is that one can sell an average of 35 ice cream cones per hour at each of your planned stops if driving through neighborhoods, while you can sell an average of 30 ice cream cones per hour if one parks the van in a public area.
 - If you choose to drive the van, you will have to consider the time spent driving the van, which will depend on the average speed from stop to stop on your route, as well as the cost of gasoline, which will depend on the number of miles per gallon the van gets. Make reasonable estimates for these and any other costs you feel would be relevant. If you drive an average of 180 miles per week, how many ice cream cones would you have to sell just to cover the cost of driving the van for a week (not including rental costs)?
 - If you choose to park the van, you will have to pay a one-time seasonal permit fee and weekly space rental. If the seasonal permit costs \$90.00 and space rental ranges from \$140 to \$150 per week, how many ice cream cones would you have to sell just to cover the cost of parking the van for a week (again, not including rental costs)? Identify any assumptions you make.
- How many hours a week will you have to work in order to make this “easy money”? After how many hours would the amounts you earned under each of the two options be the same? How much money might you be able to make if you were willing to work really hard? Identify and take into account any additional expenses for the additional hours. Explain your reasoning clearly.

Illustrative Mathematics

N-Q Traffic Jam

Alignments to Content Standards

- [Alignment: N-Q.A](#)

Tags

- *This task is not yet tagged.*

Last Sunday an accident caused a traffic jam 12 miles long on a straight stretch of a two lane freeway. How many vehicles do you think were in the traffic jam? Explain your thinking and show all calculations.

Dimensional Analysis Worksheet 2

Name: _____

Period _____

Date _____

Use dimensional analysis (the “factor-label” method) to solve the following problems. **Show all steps** needed to convert from starting units to ending units. **Indicate all relationships needed** before setting up and solving the problem. Use any of the following relationships if needed:

1 mile = 1760 yds	16 oz = 1 lb	1 L = 1.057 qts	1 day = 24 hours
1 yd = 3 ft	2000 lbs = 1 ton	4 qts = 1 gal	1 hour = 60 mins
1 ft = 12 in	1 oz = 28.35 g	32 oz = 1 qt	1 min = 60 secs
1 mile = 1.6093 km	1 kg = 2.205 lbs	1 qt = 2 pts	

1. A runner competed in a 5-mile run. How many yards did she run?
2. In the Tour de France, cyclists ride 3,653.6 km in 20 days. How many miles do they go? [Hint: watch for unimportant information!]
3. After a nice meal, perhaps you'd finish it off with a pound (1.00 lb) cake for dessert. What would the name of this cake be in grams?
4. In the US milk is sold by the gallon, while in Denmark it is sold by the liter. How many liters of milk would you need to equal one gallon?
5. If you go to school for 180 days each school year and each school day is 7 hours long, how many hours are spent in school in one school year?

Turn over!

Metric Measurement Conversion

Instructions: Use the prefix conversion chart on page 2 of your reference packet to complete the following metric equalities.

_____ kg = _____ g	_____ cm = _____ m	_____ mm = _____ m	_____ ms = _____ s
_____ km = _____ m	_____ cL = _____ L	_____ mg = _____ g	
_____ kL = _____ L	_____ mg = _____ g	_____ mL = _____ L	_____ Mg = _____ g

Use the prefix conversions chart and dimensional analysis (don't simply "move the decimal point") to convert the measurements below as indicated. You can use scientific notation for very large or small numbers.

1) 40 mL to L

11) 7870 mL to L

2) 5400 L to kL

12) 6.42 m to mm

3) 85 g to kg

13) 1850 cm to m

4) 52 mg to g

14) 11.4 km to m

5) 6300 m to km

15) 3 m to mm

6) 2.50 kg to g

16) 25 Mg to g

7) 18,600 g to kg

17) 74 cm to mm*

8) 544 mL to L

18) 835 mg to kg*

9) 1.92 L to mL

10) 425 cm to m

*two-step conversions