Unit 3, Lesson 8: More about Constant Speed

1. A kangaroo hops 2 kilometers in 3 minutes. At this rate:

a. How long does it take the kangaroo to travel 5 kilometers?

7½ minutes

$$\frac{3 \text{ min}}{2 \text{ km}} = \frac{1.5 \text{ min}}{1 \text{ km}} \times 5 = 7.5 \text{ min}$$

distance	time
2	3
1	$\frac{3}{2}$
5	7½
$\frac{4}{3}$	2

b. How far does the kangaroo travel in 2 minutes?

$\frac{4}{3}$ or $1\frac{1}{3}$ or $1.\overline{3}$ ~~miles~~ Kms

$$\frac{2 \text{ km}}{3 \text{ min}} = \frac{.66 \text{ k}}{\text{min}} \times 2 = 1.32 \text{ km}$$

2. Mai runs around a 400-meter track at a constant speed of 250 meters per minute. How many minutes does it take Mai to complete 4 laps of the track? Explain or show your reasoning.

meters	
400	

meters	min
250	1
1600	6.4

6.4

$$\frac{1600 \text{ meter}}{\frac{250}{\text{min}}}$$

3. At 10:00 a.m., Han and Tyler both started running toward each other from opposite ends of a 10-mile path along a river. Han runs at a pace of 12 minutes per mile. Tyler runs at a pace of 15 minutes per mile.

a. How far does Han run after a half hour? After an hour?

time	distance
12	1 mile
30	2.5 mi
60	5 mi

$\times 2.5$ $\times 2$
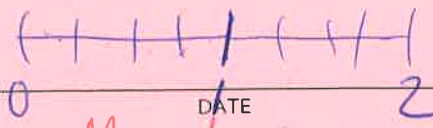
$$\frac{30}{12} = 2.5$$

15 min	1 miles
60 min	4 miles

b. Do Han and Tyler meet on the path within 1 hour? Explain or show your reasoning.
No together they've only gone 9 miles

4. Two skateboarders start a race at the same time. Skateboarder A travels at a steady rate of 15 feet per

second. Skateboarder B travels at a steady rate of 22 feet per second. After 4 minutes, how much farther will Skateboarder B have traveled? Explain your reasoning.

Handwritten work:

$\frac{feet}{15} \mid \frac{sec}{1}$ — A

$(60 \mid 24) \times 4$ → 3600

Units

60 sec / 1 min / ½

$\frac{feet}{22} \mid \frac{sec}{1}$ — B

$(88 \mid 240) \times 4$ → 5280

88 − 60 = 28 ft farther

5280 − 3600 = 1,680 feet

(from Unit 2, Lesson 16)

5. There are 4 tablespoons in $\frac{1}{4}$ cup. There are 2 cups in 1 pint. How many tablespoons are there in 1 pint? If you get stuck, consider drawing a double number line or making a table.
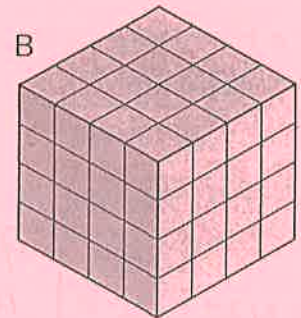
(from Unit 3, Lesson 4)

$\frac{T}{4} \mid \frac{Cup}{\frac{1}{4}}$

×8 $(32 \mid 2)$

32 T in one pint

6. Two larger cubes are made out of unit cubes. Cube A is 2 by 2 by 2. Cube B is 4 by 4 by 4. The side length of Cube B is twice that of Cube A.

a. Is the surface area of Cube B also twice that of Cube A? Explain or show your reasoning.

No, 96 un² is 4 × bigger than 24 un²

b. Is the volume of Cube B also twice that of Cube A? Explain or show your reasoning.

(from Unit 1, Lesson 12)

No 64 un³ is 8 times bigger than 8 un³

SA: 4 × 6 sides = 24 un²

V: 2×2×2 = 8 un³
2³ = 8 un³

SA: 16 × 6 = 96 un²

½ ✓ 4×4×4 = 64 un³

/9   2