26. [Units of Measurement / Time]

Skill 26.1 Converting customary units of length.

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

- Use these conversion factors for customary units of length.

1 mi = **1760** yd = **5280** ft
1 yd = **3** ft = **36** in.
1 ft = **12** in.

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change inches to feet ÷ by 12

To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change feet to inches × by 12

Q. 26 ft = [ ] yd [ ] ft

A. *26 ft = 26 ÷ 3 yd* (ft to yd: ÷ 3)
= 8 yd and 2 ft remaining
= 8 yd 2 ft

a) 3 feet = [36] inches

3 × 12 = 36 (ft to in.: × 12)

b) 9 yards = [ ] feet

(yd to ft: × 3)

c) 144 in. = [ ] ft

d) 2 yd = [ ] in.

e) 33 ft = [ ] yd

f) 72 in. = [ ] yd

g) 120 in. = [ ] ft

h) 60 ft = [ ] yd

i) 27 in. = [ ] ft [ ] in.

j) 10 ft = [ ] yd [ ] ft

k) 4 ft 9 in. = [ ] in.

l) 5 yd 1 ft = [ ] ft

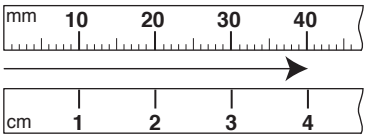
Skill 26.2 Converting metric units of length.

- Use these conversion factors for metric units of length.

1 km = **1000** m = **100,000** cm = **1,000,000** mm
1 m = **100** cm = **1000** mm
1 cm = **10** mm

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change mm to cm ÷ by 10



To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change cm to mm × by 10

Q. 3800 cm = ☐ m

A. *3800 cm = 3800 ÷ 100 m* (cm to m: ÷ 100)
*= **38 m***

a) 24 cm = 240 mm

24 × 10 = 240 (cm to mm: × 10)

b) 120 mm = ☐ cm

(mm to cm: ÷ 10)

c) 130 cm = ☐ mm

d) 270 cm = ☐ m

e) 7000 m = ☐ km

f) 6.4 m = ☐ cm

g) 19 m = ☐ mm

h) 50 mm = ☐ cm

i) 0.2 km = ☐ cm

j) 500 mm = ☐ m

k) 450 cm = ☐ m

l) 5.1 m = ☐ mm

Skill 26.3 Converting customary units of mass.

- Use these conversion factors for customary units of mass.

1 ton	=	**2000** lb	= **32,000** oz
1 lb	=		**16** oz

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change oz to lb ÷ by 16

To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change lb to oz × by 16

Q. 2 lb 12 oz = ☐ oz

A. *2 lb 12 oz = 2 × 16 oz + 12 oz* (lb to oz: × 16)
= 32 oz + 12 oz
= 44 oz

a) 4 tons = 8000 pounds

(T to lb: × 2000)

4 × 2000 = 8000

b) 3 pounds = ☐ ounces

(lb to oz: × 16)

c) 160 oz = ☐ lb

d) 12,000 lb = ☐ T

e) 4.5 T = ☐ lb

f) 96 oz = ☐ lb

g) 5 lb = ☐ oz

h) 3.5 T = ☐ lb

i) 5500 lb = ☐ T ☐ lb

j) 53 oz = ☐ lb ☐ oz

k) 1 lb 10 oz = ☐ oz

l) 3 T 500 lb = ☐ lb

Skill 26.4 Converting metric units of mass.

- Use these conversion factors for metric units of mass.

1 tonne = **1000** kg = **1,000,000** g
1 kg = **1000** g

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change g to kg ÷ by 1000

To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change kg to g × by 1000

Q. 30 g = ☐ kg

A. *30 g = 30 ÷ 1000 m* (g to kg: ÷ 1000)
= 0.030 (3 zeros, 3 places to the left)
= 0.03 kg

a) 8 kg = 8000 g (kg to g: × 1000)
(3 zeros, 3 places to the right)
8 × 1000 = 8000

b) 9000 g = ☐ kg (g to kg: ÷ 1000)

c) 260 g = ☐ kg

d) 3.4 kg = ☐ g

e) 510 g = ☐ kg

f) 700 g = ☐ kg

g) 25.9 kg = ☐ g

h) 0.9 kg = ☐ g

i) 80 g = ☐ kg

j) 0.65 t = ☐ kg

k) 3800 kg = ☐ t

l) 12.5 t = ☐ kg

Skill 26.5 Converting customary units of capacity.

- Use these conversion factors for customary units of capacity.

1 gal = **4** qt = **8** pt = **16** c = **128** fl oz
1 qt = **2** pt = **4** c = **32** fl oz
1 pt = **2** c = **16** fl oz
1 c = **8** fl oz

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change fl oz to cups ÷ by 8

To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change qt to pt × by 2

Q. 15 qt 1 pt = ☐ pt

A. *15 qt 1 pt = 15 × 2 pt + 1 pt*
= 30 pt + 1 pt
= 31 pt
(qt to pt: × 2)

a) 6 gal = 48 pt (gal to qt: × 4) (qt to pt: × 2)

6 × 4 × 2 = 24 × 2 = 48

b) 13 qt = ☐ pt (qt to pt: × 2)

c) 24 pt = ☐ qt

d) 16 pt = ☐ gal

e) 5 gal = ☐ qt

f) 4 gal = ☐ pt

g) 180 pt = ☐ qt

h) 60 qt = ☐ gal

i) 31 qt = ☐ gal ☐ qt

j) 13 pt = ☐ qt ☐ pt

k) 3 gal 5 pt = ☐ pt

l) 4 gal 2 qt = ☐ qt

Skill 26.6 Converting metric units of capacity.

- Use these conversion factors for metric units of capacity.

1 kL = **1000** L = **1,000,000** mL
1L = **1000** mL or 1000 cm^3

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change mL to L ÷ by 1000

To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change kL to L × by 1000

Q. 750 mL = ☐ L

A. *750 mL = 750 ÷ 1000 L* (mL to L: ÷ 1000)
= 0.750 (3 zeros, 3 places to the left)
= 0.75 L

a) 3.7 L = 3700 mL (L to mL: × 1000)

3.7 × 1000 = 3700

b) 6 L = ☐ mL (L to mL: × 1000)

c) 22 L = ☐ mL

d) 8000 mL = ☐ L

e) 250 mL = ☐ L

f) 9.4 L = ☐ mL

g) 0.5 L = ☐ mL

h) 1.25 L = ☐ mL

i) 30,000 mL = ☐ L

j) 15.3 L = ☐ mL

k) 40 L = ☐ mL

l) 500 mL = ☐ L

Skill 26.7 Converting units of time.

- Use these conversion factors for units of time.

1 week =	**7** days =	**168** h =	**10,080** min =	**604,800** s
1 day =	**24** h =	**1440** min =	**86,400** s	
1 h =	**60** min =	**3600** s		
	1 min =	**60** s		

To change from **smaller** units to **larger** units
- Divide by the conversion factor (because you need less).

Example: To change s to min ÷ by 60

To change from **larger** units to **smaller** units
- Multiply by the conversion factor (because you need more).

Example: To change h to min × by 60

Q. 1 week, 6 days = ☐ h

A. *1 week 6 days* $= 1 \times 7$ *days* $+ 6$ *days* (week to days: × 7)
$= 13$ *days*
13 days $\times 24$ *h* $=$ ***312 h*** (days to h: × 24)

a) $2\frac{1}{3}$ day = 56 h (day to h: × 24)

$2 \times 24 + \frac{1}{3} \times 24 = 48 + 8 = 56$

b) 5 hours = ☐ minutes (h to min: × 60)

c) 4 minutes = ☐ seconds

d) 180 s = ☐ min

e) $\frac{3}{4}$ day = ☐ h

f) $2\frac{1}{2}$ h = ☐ min

g) $1\frac{1}{4}$ h = ☐ min

h) 200 min = ☐ h ☐ min

i) 144 min = ☐ h ☐ min

j) 5 min 30 s = ☐ s

k) 3 week, 5 days = ☐ days

l) 4 h 40 min = ☐ min

Skill 26.8 Finding the elapsed time between two events.

- Calculate the time until the next closest hour.
  A.M. to P.M.
- Add the time to midday.
- Then add the remaining time.

P.M. to A.M.
- Add the time to midnight.
- Then add the remaining time.

Q. School starts at 8:50 A.M. and ends at 2:30 P.M. How long is a school day in hours and minutes?

A. *8:50 to 9:00 = 10 min*
9:00 to 12:00 = 3 h
12:00 to 2:30 = 2 h 30 min
10 min + 3 h + 2 h + 30 min
= ***5 h 40 min***

a) Find the time in hours and minutes between 8:30 A.M. and 3:00 P.M. the same day.

8:30 to 9:00 = 30 min, 9:00 to 12:00 = 3 h

12:00 to 3:00 = 3 h

30 min + 3 h + 3 h ⇒ ☐

b) The movie begins at 3:15 P.M. and ends at 5:00 P.M. How long is the movie in hours and minutes?

⇒ ☐

c) Mom started cooking at 6:20 P.M. and finished at 7:35 P.M. How long did she cook in hours and minutes?

⇒ ☐

d) Find the time in hours and minutes between 6:30 P.M. and 2:10 A.M. the next day.

⇒ ☐

e) Find the time in hours and minutes between 4:00 A.M. and 2:25 P.M. the same day.

⇒ ☐

f) Find the time in hours and minutes between 09:10 and 16:20 the same day.

⇒ ☐