



# Medical Assistant

Math Module





# Managing Time & Measuring with the Metric System



Lindsay Hamil is a medical assistant who just started a new job at a small clinic near Spokane, WA. Typically, she spends half her day scheduling appointments and the other half of the day assisting the

doctors with patient care. Lindsay assists Dr. Ramos, a full-time physician at the clinic and Dr. Greenberg and Dr. Turkoglu, who both work part-time for the clinic. Lindsay really enjoys working at the clinic. Her work is both challenging and rewarding. Most of all, she enjoys helping and assisting the patients that she sees on a regular basis.



# + Focus

- 1) The first part of this math strand focuses on calculating and converting time in order to perform everyday math tasks. You will be introduced to adding, subtracting, multiplying and dividing time (in hours and minutes), and you will also learn how to convert hours to minutes and minutes to hours in order to perform these kinds of math tasks.
- 2) The second part of this Math Strand focuses on adding, subtracting, multiplying and dividing liters and milliliters. First, you will practice converting metric units using a conversion table. Then you will see various everyday math tasks that you may see in a doctor's office, clinic, hospital or other healthcare facility.





# Task One: Managing a Doctor's Schedule



Lindsay does a lot of math while she juggles the doctors' and patients' schedules.

## Adding Time

Lindsay always schedules patients to see Dr. Turkoglu. One morning Dr. Turkoglu tells Lindsay that he has a meeting that begins at 9:30 am and will last about 2 hours and 15 minutes. He then plans to take a 25 minute break before another meeting that will last about 1 hour and 40 minutes. Lindsay has to figure out how long Dr. Turkoglu will be busy so that she will know when she may begin scheduling patients for him.



# + Listen



**Listen and follow along as Lindsay as she explains how she figured out how long Dr. Torkoglu will be busy that morning.**

“The first thing I did was add all the minutes and all the hours, each one separately. I got 3 hours and 80 minutes.

Then I converted the minutes to hours by dividing. I knew that there are 60 minutes in an hour so I divided 80 by 60. I got one hour with 20 minutes left over so I knew that 80 minutes is equal to 1 hour and 20 minutes.

Finally, I added the 1 hour and 20 minutes to the 3 hours.

Once I did all these steps I realized that Dr. Turkoglu would be busy for a total of 4 hours and 20 minutes.”



# + Steps



**Look at the steps Lindsay followed to add time segments.**

Step 1: Add all the minutes and all the hours.

$$\begin{array}{r} 2 \text{ hr } 15 \text{ min} \\ \quad 25 \text{ min} \\ + \underline{1 \text{ hr } 40 \text{ min}} \\ 3 \text{ hr } 80 \text{ min} \end{array}$$



# + Steps

Step 2: Convert the smaller unit of time (minutes) to the larger unit of time (hours) by dividing (since there are 60 minutes in an hour you will divide 80 minutes by 60 minutes).

$80 \text{ min} \div 60 \text{ min} = 1 \text{ hr with } 20 \text{ min left over}$   
(Thus, 80 minutes is equal to 1 hour and 20 minutes.)

Step 3: Add the result of Step 2 to the total hours in Step 1.

$$\begin{array}{r} 3 \text{ hr} \\ + 1 \text{ hr } 20 \text{ min} \\ \hline 4 \text{ hr } 20 \text{ min} \end{array}$$

**Answer: Dr. Turkoglu will be busy for a total of 4 hours and 20 minutes.**



# + Think About It!



When will Dr. Turkoglu be free to meet with other patients? (Recall that he came to the office at 9:30.)

If Dr. Turkoglu is busy for a total of 4 hour and 20 minutes, then we must add 4 hours and 20 minutes to the original time that he began, 9:30.

$$\begin{array}{r} 9 \text{ hrs } 30 \text{ min} \\ + 4 \text{ hrs } 20 \text{ min} \\ \hline 13 \text{ hrs } 50 \text{ min} \end{array}$$

Since we want to know the exact time in the afternoon, we need to remember that after 12 o'clock noon, we typically say the next hour is one o'clock, not 13 o'clock (although, in military time, it would be called 13 hundred hours). Rather than 13 hours and 50 minutes, we say the time is 1:50 pm.

Thus, Dr. Turkoglu will be free at 1:50 in the afternoon.



# + Practice

**A: Add these Hours and Minutes (Simplify all Answers)**

$$\begin{array}{r} 1) \quad 5 \text{ hr } 45 \text{ min} \\ + \quad 2 \text{ hr } 12 \text{ min} \\ \hline 7 \text{ hr } 57 \text{ min} \end{array}$$

$$\begin{array}{r} 2) \quad 3 \text{ hr } 5 \text{ min} \\ + \quad 1 \text{ hr } 55 \text{ min} \\ \hline 5 \text{ hr} \end{array}$$

$$\begin{array}{r} 3) \quad 9 \text{ hr } 38 \text{ min} \\ + \quad 5 \text{ hr } 28 \text{ min} \\ \hline 15 \text{ hr } 6 \text{ min} \end{array}$$



# + Practice

$$\begin{array}{r} 4) \quad 7 \text{ hr } 45 \text{ min} \\ + \quad 2 \text{ hr } 29 \text{ min} \\ \hline 10 \text{ hr } 14 \text{ min} \end{array}$$

$$\begin{array}{r} 5) \quad 13 \text{ hr } 49 \text{ min} \\ + \quad 2 \text{ hr } 27 \text{ min} \\ \hline 16 \text{ hr } 16 \text{ min} \end{array}$$

$$\begin{array}{r} 6) \quad 17 \text{ hr } 45 \text{ min} \\ + \quad 6 \text{ hr } 20 \text{ min} \\ \hline 24 \text{ hr } \quad 5 \text{ min} \end{array}$$



# + Practice

## **B: Solve these Word Problems (Simplify all Answers)**

- 1) Lindsay needs to find out how much time Dr. Ramos spent on direct patient care in a week. When Lindsay looks at the patient log, she notes that on Monday Dr. Ramos spent a total of 5 hours 25 minutes, on Tuesday he spent 7 hours 48 minutes, on Wednesday he spent 6 hours 17 minutes, on Thursday he spent 6 hours 45 minutes, and on Friday he spent 2 hours 55 minutes. How much time total did he spend on direct patient care during this week?

29 hrs 10 min



# + Practice

2) Lindsay was directed to calculate the number of hours the other doctors worked the same week. If it shows in Dr. Turkoglu's log that he worked 5 hours 20 minutes on Monday, 6 and a half hours on Wednesday, and 6 hours 45 minutes on Friday, how many hours did Dr. Turkoglu work that week?

18 hrs 35 min

3) Dr. Greenberg's log showed 8 hours 25 minutes on Tuesday and 7 hours 48 minutes on Thursday. Who worked more hours this week, Dr. Greenberg or Dr. Turkoglu? (Look at the answer you got for #2.)

Dr. Turkoglu worked more hours  
(Since Dr. Greenberg worked 16 hrs 13 min, while Dr. Turkoglu worked 18 hrs 35 min – see #2)

# + Practice

4) If Lindsay were asked to find the total number of hours that all of the doctors spent with patients during this week, what would be the total time?

63 hrs 58 min





# Think About It!



Which day did the doctors spend the most time on patient care?

**Tuesday:** The answer was found by adding up the total hours and minutes all doctors spent on patient care each day. Tuesday has the highest total number of hours spent on patient care.

If the doctors are not providing “direct patient care” how might they be spending their time?

Some possibilities are: looking at charts, reading up on the most recent studies of certain illnesses in their office, and meeting with a pharmaceutical representative. Doctors are not only busy with patient care which is why it’s important to be able to help them manage their busy schedules no matter what they are doing.

For More Practice Adding Time, Click [Here](#)





# Task Two: Getting a Patient to his or her Appointment on Time



## Subtracting Time

A patient who has an appointment at 2:15 pm lives approximately 25 minutes away. She asks Lindsay what time she should leave her house in order to make it to her appointment with 10 minutes to spare. What time will Lindsay tell her to leave her house?



# + Listen



**Listen and follow along as Lindsey explains the steps she followed to find out what time the patient needed to leave her house.**

“The first thing I did was add the travel time and the amount of time that she wishes to have before her appointment together and got 35 minutes.

Then I knew I needed to subtract 35 minutes from 2:15. But before I did this, I changed 2:15 to 2 hours and 15 minutes.

I knew I couldn't subtract 35 minutes from 15 minutes, so I borrowed from the hours. Since I borrowed from 2 hours, I now only had 1 hour left.





# + Listen



Then I converted the hour I borrowed into minutes. I knew that there are 60 minutes in 1 hour so multiplied 1 hour times 60 minutes per hour.

After that, I added 60 minutes to the original amount of minutes I was subtracting from, which was 15 minutes. I then found that 2 hours and 15 minutes is equal to 1 hour and 75 minutes.

Then I rewrote my subtraction problem placing the new number 1 hr 75 min on the top part of the problem. Then I subtracted and got 1 hour and 40 minutes.

Finally, I changed 1 hour 40 minutes back to actual time – 1:40 pm – the opposite process of what you did earlier in step number 2.

Based on all of these steps, I should tell the patient to leave her house by 1:40 pm in order to make it to her appointment with 10 minutes to spare.”



# + Steps

**Look at the steps again.**

Step 1: Add the minutes together.

$$\begin{array}{r} 25 \text{ min} \\ + 10 \text{ min} \\ \hline 35 \text{ min} \end{array}$$

Step 2: Subtract the answer you got in Step 1 from 2:15. In order to do this, change 2:15 to 2 hours and 15 minutes. Write it out like this:

$$\begin{array}{r} 2 \text{ hr } 15 \text{ min} \\ - \quad 35 \text{ min} \\ \hline \end{array}$$



# + Steps

Step 3: Since you can't subtract 35 minutes from 15 minutes, you need to borrow from the larger unit of time (hours). If you borrow from 2 hours, you will have 1 hour left.

You will also have to convert 1 hour (the one hour you borrowed) into minutes. Since there are 60 minutes in 1 hour, you will multiply 1 hour times 60 minutes per hour.

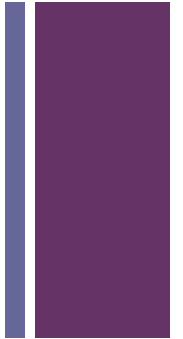
$$1 \text{ hr} \times 60 \text{ min per hour} = 60 \text{ min}$$

Now you will need to add the number of minutes you have (60 min) to the original amount of minutes you were subtracting from (15 min).

$$60 \text{ min} + 15 \text{ min} = 75 \text{ min}$$

Thus, 2 hours and 15 minutes is equal to 1 hour and 75 minutes.

$$2 \text{ hr } 15 \text{ min} = 1 \text{ hr } 75 \text{ min}$$



# + Steps

Step 4: Rewrite your subtraction problem using the new number 1 hr 75 min

$$\begin{array}{r} 1 \text{ hr } 75 \text{ min} \\ - \quad \underline{35 \text{ min}} \\ 1 \text{ hr } 40 \text{ min} \end{array}$$

Step 5: Now change 1 hour 40 minutes back to actual time 1:40 pm (the opposite process of Step 2)

**Answer:** Lindsay should tell the patient to leave by 1:40 pm in order to make it to her appointment with 10 minutes to spare.



# + Practice

**A: Subtract these Hours and Minutes (Simplify all Answers).**

$$\begin{array}{r} 1) \quad 13 \text{ hrs } 49 \text{ min} \\ - \quad 2 \text{ hrs } 27 \text{ min} \\ \hline 11 \text{ hr } 22 \text{ min} \end{array}$$

$$\begin{array}{r} 2) \quad 9 \text{ hr } 15 \text{ min} \\ - \quad 2 \text{ hr } 35 \text{ min} \\ \hline 6 \text{ hr } 40 \text{ min} \end{array}$$

$$\begin{array}{r} 3) \quad 13 \text{ hr} \\ - \quad 7 \text{ hr } 14 \text{ min} \\ \hline 5 \text{ hr } 46 \text{ min} \end{array}$$

# + Practice

$$\begin{array}{r} 4) \quad 10 \text{ hrs } 45 \text{ min} \\ - \quad 6 \text{ hrs } 52 \text{ min} \\ \hline \quad 3 \text{ hr } 53 \text{ min} \end{array}$$

$$\begin{array}{r} 5) \quad 11 \text{ hr } 38 \text{ min} \\ - \quad 5 \text{ hr } 55 \text{ min} \\ \hline \quad 5 \text{ hr } 43 \text{ min} \end{array}$$

$$\begin{array}{r} 6) \quad 7 \text{ hr } 45 \text{ min} \\ - \quad 19 \text{ min} \\ \hline \quad 7 \text{ hr } 26 \text{ min} \end{array}$$



# + Practice

## B: Solve these Word Problems (Simplify all Answers)

- 1) Lindsay starts her day at 7:45 am and typically works 7 hours and 30 minutes every Monday through Friday. Last week she followed this schedule Monday through Thursday, but on Friday she had an appointment so she left at 12:30 pm. How many hours did she work last week?

34 hrs 45 min

- 2) A patient had an appointment for 3:20 in the afternoon, but had several errands to run before her appointment. She left her house at 8:30 am. How much time did she have for her errands between the time she left her home and her appointment?

6 hrs 50 min

# + Practice

3) A patient at the clinic has been suffering from sleep apnea (a sleep disorder which typically causes a person to stop breathing repeatedly during sleep). Dr. Greenberg needs to spend some extra time reading the patient's charts before their appointment at 11:15 am. She estimated that she needs one hour and 20 minutes to prepare for her appointment. What is the latest time she needs to begin reading the patient's charts in order to be ready for the appointment on time?

9:55 a.m.

4) Lindsay needs to FedEx a set of charts to another clinic out of the state, but in the same time zone. The other clinic needs the charts by Wednesday morning at 10:00. If a FedEx shipment takes approximately 22 hours, what time does Lindsay need to ship the package?

12 o'clock noon





# Task Three: Calculating the Number of Hours Worked in a Week

Lindsay is scheduled to work 7 hours and 30 minutes five days a week. How many hours will she be working every week?

## Stop!

When multiplying time, you must multiply each individual unit separately. Then you may proceed to convert the units after you have multiplied them.



# + Listen



**Listen and follow along as Lindsay explains the steps she followed to find out how many hours she works in a week:**

I knew I needed to keep each unit of time separate, so first I multiplied 30 minutes per day by 5 days and got 150 minutes. Then I multiplied 7 hours per day by 5 days which is 35 hours.

Then I converted the minutes to hours by dividing. Since there are 60 minutes in an hour I divided 150 minutes by 60 minutes and got 2 hours and 30 minutes left over. So I know that 150 minutes is equal to 2 hours and 30 minutes.

Finally I added 2 hours and 30 minutes to 35 hours and got 37 hours and 30 minutes. I will be working 37 hours and 30 minutes per week at the clinic.



# + Steps

**Look at the steps again.**

Step 1: First multiply 30 minutes per day by 5 days. Then multiply 7 hours per day by 5 days.

$$\begin{array}{r} 7 \text{ hrs } 30 \text{ min per day} \\ \times \quad 5 \text{ days} \\ \hline 35 \text{ hrs } 150 \text{ min} \end{array}$$

(Notice how Lindsay separated the hours and minutes in the problem above. Until you get used to the concept of adding hours and minutes, you may find that drawing a vertical line separating the units helps you.)



# + Steps

Step 2: Convert the smaller unit of time (minutes) to the larger unit of time (hours) by dividing. Since there are 60 minutes in an hour you will divide 150 minutes by 60 minutes.

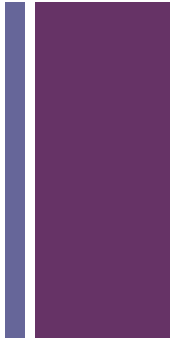
$$150 \text{ min} \div 60 \text{ min} \rightarrow 2 \text{ hr } 30 \text{ min}$$

150 minutes is equal to 2 hour and 30 minutes.

Step 3: Add the result of Step 2 to the total hours in Step 1.

$$\begin{array}{r} 35 \text{ hrs} \\ + 2 \text{ hrs } 30 \text{ min} \\ \hline 37 \text{ hrs } 30 \text{ min} \end{array}$$

Answer: Lindsay will be working 37 hours and 30 minutes per week at the clinic (or 37 and a half hours).



# + Stop!



Remember to keep the units of time separate when you multiply. Then convert your minutes to hours, when appropriate.



# + Practice

**A: Multiply the following Times (Simplify all Answers).**

1) 13 hrs 30 min per day

x 7 days

94 hrs 30 min

2) 5 hrs 12 min per day

x 3 days

15 hrs 36 min

3) 5 hrs 33 minutes per day

x 6 days

33 hrs 18 min



# + Practice

4)            20 hrs 12 min per day  
x    4 days

80 hrs 48 min

5)            3 hrs 30 min per day  
x    12 days

42 hrs

6)            4 hrs 7min per day  
x    10 days

41 hr 10 min



# + Practice

## **B: Solve these Word Problems (Simplify all Answers)**

1) Dr. Ramos wants to know how much time he devoted to patient care last month. He knew that on average, he was spending about 36 hours and 25 minutes on patient care every week. How much time did he spend on patient care for an entire month, assuming there are 4 weeks in a month?

145 hrs 40 min

2) Together, Dr. Turkoglu and Dr. Greenberg were spending an average of 12 hours and 45 minutes less than Dr. Ramos on patient care per week. How much time were they spending on patient care in an average week?

23 hrs 40 min



# + Practice

3) If a dialysis (treatment for a chronic kidney disease) patient comes into the clinic 3 times a week for 3 hours and 15 minutes per visit, how much time does he/she spend in 4 weeks?

39 hrs

4) If Lindsay works 37 and a half hours per week for one full month, how many total hours does she work, assuming there are 4 weeks per month?

150 hrs





# Task Four: Computing a Doctor's Daily Work Schedule



## Dividing Time

How many patients can Dr. Ramos see in an 8 and a half hour day if each appointment is 15 minutes long? (Assume he does not take a break.)



Similar to when you multiply time, you must remember to keep the units of time separate when you divide. When you are done dividing each unit separately, you will then convert minutes to hours, when appropriate.



# + Listen



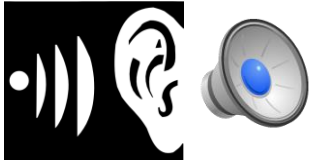
**Listen and follow along as Lindsay explains the steps she followed to find out how many patients Dr. Ramos can see in an 8 and a half hour work-day:**

“I began by dividing 15 minutes into 8 hours and 30 minutes. However, since I know that 15 does not divide into 8 evenly, I converted the hours into minutes. Since there are 60 minutes in an hour, I multiplied 8 hours times 60 minutes per hour and got 480 minutes.

Then, in order to find the total amount of time in minutes, I added 480 minutes to 30 minutes, which was the original number of minutes. The total amount of time was 510 minutes.



# + Listen



Finally I divided the 510 minutes by 15 minutes to find the number of patients Dr. Ramos can see in an 8 and a half hour work day and found 34.

Dr. Ramos can see a total of 34 patients during an 8 and a half hour day.”



# + Steps

**Look at the steps again.**

Step 1: You would begin dividing 15 minutes into 8 hours and 30 minutes.

$$8 \text{ hr } 30 \text{ min} \div 15 \text{ min}$$

However, since 15 does not go into 8, you must convert the bigger unit of time (hours) into the smaller unit of time (minutes). Since there are 60 minutes in an hour, you will multiply 8 hours by 60 minutes per hour.

$$8 \text{ hr} \times 60 \text{ min per hr} = 480 \text{ min}$$



# + Steps

Step 2: Now add the result from Step 1 to the original amount of minutes (30) in order to find the total amount of time in minutes.

$$\begin{array}{r} 480 \text{ min} \\ + 30 \text{ min} \\ \hline 510 \text{ min} \end{array}$$

Step 3: Divide result from Step 2 (480 minutes) by 15 minutes.

$$510 \text{ min} \div 15 \text{ min} = 34$$

**Answer:** Dr. Ramos can see a total of 34 patients during an 8 and a half hour day. (Remember, this is assuming no breaks...of course, in real life, physicians will need to take a couple of breaks during the day.)



# + Practice

**A: Divide the following Hours and Minutes (Simplify all Answers)**

1) 12 hrs 35 min  $\div$  5 =

2 hrs 31 min

2) 21 hrs 20 min  $\div$  8 =

2 hrs 40 min

3) 14 hrs 35 min  $\div$  7 =

2 hrs 5 min

4) 17 hrs 24 min  $\div$  12 =

1 hr 27 min

5) 12 hrs 51 min  $\div$  3 =

4 hrs 17 min

6) 47 hrs 45 min  $\div$  15 =

3 hrs 11 min



# + Practice

## B: Solve these Word Problems (Simplify all Answers)

- 1) During a busy day, the doctors have a total of 15 hours and 45 minutes of time for meeting with patients. If they divided this time up evenly among the three of them, how much time would each have to meet with patients?

5 hrs 15 min

- 2) Dr. Ramos wanted to know the average amount of time he spent with each patient in relation to the number of hours he worked in a given week. If he had 37 hours and 16 minutes for the week with direct patient care and met with 52 patients during the week, what was the average amount of time he spent with each patient that week?

43 min



# + Practice

3) Every Friday, Dr. Ramos divide his time evenly among his patients. If he has a total of 8 hours to spend with patients and has a total of 40 patients to see, how long can he spend with each patient.

12 min

4) Last Wednesday, Dr. Greenberg had a  $6\frac{1}{2}$  hour day and took a 40 minute lunch break during that time. What was the maximum number of 25 minute appointments she could have had last Wednesday?

14 appointments



# + Congratulations!

Good job. You have completed Part 1 of this module.

Now go on to Medical Assistant Part 2.



The  
End