

Lesson 3: Elapsed Time (2 Days)

Getting Started

? Questions to Explore

- What can we measure?
- How do we measure time?



Facts and Definitions

- **Elapsed time:** time it takes from the start of an activity or event to the end



Skills

- Tell and write time to the nearest minute and measure time intervals in minutes



Materials

- | | |
|-------------------------------------|------------------------|
| ✓ fine point dry-erase marker (kit) | ✓ geared clock (kit) |
| ✓ index cards (kit) | ✓ Interactive Notebook |
| ✓ scratch paper | ✓ whiteboard (kit) |

Introduction

Ask your child, "How long do you think it takes you to brush your teeth? Eat breakfast? Watch a movie?" Explain that the amount of time it takes from the beginning of an activity or event to the end is called **elapsed time**. Elapsed time helps us figure out how much time we spend doing an activity or how long we have until an event begins. Elapsed time is very useful in life!

Say, "Let's start by measuring elapsed time in hours." Ask your child to show you 9:00 on his geared clock. Ask, "If we left home at this time and had to drive for 2 hours, what time would we get to our destination?" Your child will move the hour hand two hours ahead and read the new time. He should find that you will finish your drive at 11:00. Say, "Here's another one. Show me 1:00 on the clock. Let's pretend I will take you to the park in four hours. What time will we go to the park?" (5:00)

Next, show how elapsed time can also measure the passing of time in minutes. Have your child show the time 6:30. Say, "How can we use the clock to show that 15 minutes pass?" He should move the minute hand from 6 to 9, counting five minutes at each numbered interval. Ask, "What time is it after 15 minutes have passed?" (6:45) Say, "Let's try another one. Set the clock to 10:05. Timmy's friend comes to play at 10:05 and leaves at 10:40. How much time did Timmy get to play with his friend?" (35 minutes) To assist your child with this increased counting span, it may be helpful to point a pencil tip at 10:40 as your child counts by fives from 10:05. Make sure he is counting up as he passes each numbered interval.

Ask, "What have you learned so far about elapsed time?"

Activities

Activity 1: Now and Later

Your child will practice elapsed time using an interactive tool at the following web link. Click "Show" and make sure that the start and end clocks show the same time. This will ensure that the elapsed time shows 0:00. Say, "Look at these clocks. At this point, the start and the end times are the same, so no time has passed, or elapsed."

Now, move the minute hand on the right-hand clock (the end time) one minute at a time so your child can see the elapsed time changing. Allow your child to explore this interactive tool for a few minutes to get used to it and then pose the following questions. He will use the interactive clocks to find the answers.

- Set both clocks to 2:15. What will the time be after 25 minutes have elapsed?
- Set both clocks to 5:00. How much time will have elapsed when it is 6:00?
- Set both clocks to 7:50. What time will it be in 15 minutes?

For the last one, point out that when the minute hand passes the 12, the hour hand moves to the next hour. Say, "Sometimes elapsed time requires us to go into the next hour and start counting the minutes again from zero."

Elapsed Time Clock
www.movingbeyondthepage.com/link/9445/

Next, explain that sometimes we measure elapsed time in minutes and sometimes in hours, but we can also measure it in both hours and minutes together. Provide time for your child to watch the video on elapsed time at the following web link.

Elapsed Time Third Grade
www.movingbeyondthepage.com/link/9446/

Have your child use either his geared clock or the interactive clocks at the web link to practice finding elapsed time with these problems:

- The time is 3:00. What time will it be after 1 hour and 20 minutes have elapsed? (4:20)
- The time is 12:20. The movie begins in 2 hours and 10 minutes. What time does the movie begin? (2:30)
- The time is 8:55. What time will it be after 1 hour and 20 minutes have elapsed? (10:15)

Your child will complete the "Now and Later" sheet by filling in the blanks for the "later" times next to each clock. Tell him to use the geared clock as needed to find the answers.

Answer Key:

- **Clock 1 = 6:30**
10 minutes later: (6:40)
25 minutes later: (6:55)
30 minutes later: (7:00)
45 minutes later: (7:15)
- **Clock 2 = 11:25**
7 minutes later: (11:32)
20 minutes later: (11:45)
40 minutes later: (12:05)
60 minutes later: (12:25)
- **Clock 3 = 1:40**
30 minutes later: (2:10)
1 hour later: (2:40)
12 minutes later: (1:52)
1 hour and 15 minutes later: (2:55)
- **Clock 4 = 8:25**
30 minutes later: (8:55)
60 minutes later: (9:25)
10 minutes later: (8:35)
2 hours and 3 minutes later: (10:28)

When your child finishes the "Now and Later" sheet, ask, "What strategies did you use to help you find the later times?" Give him time to talk about how he found the times, and encourage him to think about using addition as he works with elapsed time.

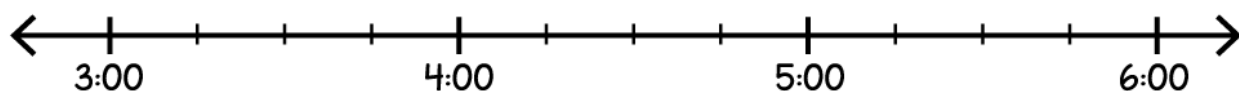
Activity 2: Elapsed Time on Number Lines

Another helpful tool for solving elapsed time problems is a number line. Show your child the video at the following web link to introduce this concept.

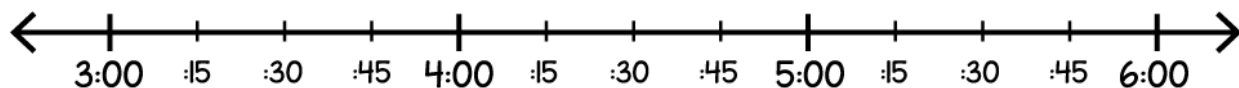
Elapsed Time: How to Solve Elapsed Time on a Number Line

www.movingbeyondthepage.com/link/6938/

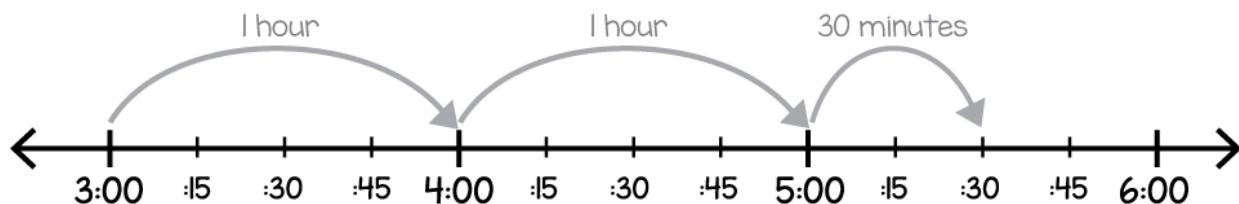
Now, say, "Let's use a number line to solve this elapsed time problem. Zack watched a movie that started at 3:00 and ended at 5:30. How much time elapsed while Zack was watching the movie?" Have your child draw a number line with marks for 3:00, 4:00, 5:00, and 6:00. Make sure he understands that 3:00 shows the time the movie begins and 6:00 is the next whole hour after the movie ends. On your child's number line, add hash marks as shown in the following image.



Ask, "Do you notice the smaller lines between the hours? What do you think those lines show?" As needed, use the geared clock to remind your student that hours are divided into four quarters, or 15-minute sections. Ask your child to show you where 3:30 is on the number line. Below that line, write :30. Make sure he understands that this line represents 3:30 because it is halfway between the 3:00 and the 4:00. Repeat with 4:30 and 5:30. Next, ask which lines show fifteen minutes after the hour? Label these marks as :15. Repeat this process to mark the three-quarter hours as :45. To make sure your child understands these marks, point to several marks on the number line and ask him to tell you the time indicated.



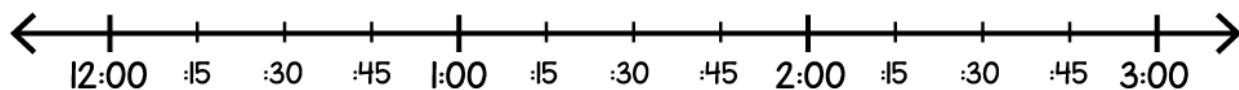
Say, "Now we can use the number line to find the answer to our problem. The movie started at 3:00 and ended at 5:30, so let's start at 3:00 and count up." Have your child draw a large arc from 3:00 to 4:00 and from 4:00 to 5:00. Label each arc as 1 hour. Then, have him draw a shorter arc from 5:00 to 5:30 and label this 30 minutes. Add the times together:



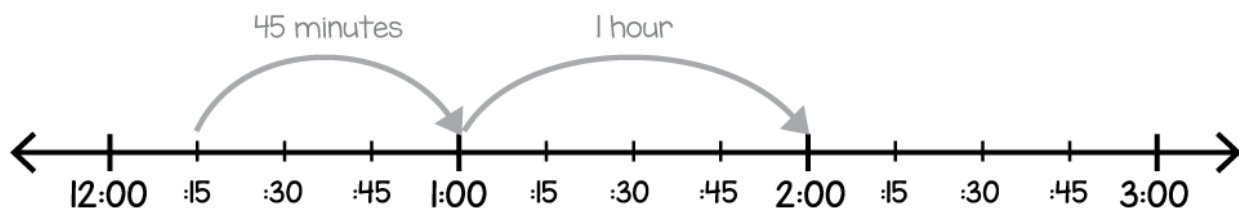
$$1 \text{ hour} + 1 \text{ hour} + 30 \text{ minutes} = 2 \text{ hours } 30 \text{ minutes}$$

Ask, "Do our activities always start at a whole hour time? Let's do another example with a time that starts between whole hours. Jenny went to the park at 12:15 and played for 1 hour and 45 minutes. What time did she leave the park?" Guide your child through the steps of drawing and labeling a number line. To help him determine where to start and end the number line, ask, "What whole hour comes before 12:15?" (12:00) "That's where we will start the number line. To get the end time, think about how many whole hours 1 hour and 45 minutes is close to." (2 hours). What is two hours more than

12:00?" (2:00) "To be sure we have enough time, go on to the next hour and label it as the end of the number line." The final number line should look like this:



Say, "Remember that Jenny went to the park at 12:15. Find this time on the number line. Now, we need to draw an arc from 12:15 to the next whole hour, which is 1:00. How many minutes is it from 12:15 to 1:00?" Label that arc as 45 minutes. Say, "Jenny was at the park for 1 hour and 45 minutes. You just marked 45 minutes, so now let's mark the one hour." Your child will draw an arc from 1:00 to 2:00 and label it as 1 hour. Point to the labeled arcs to show that you measured one hour and 45 minutes total. Ask, "What time did Jenny leave the park?"

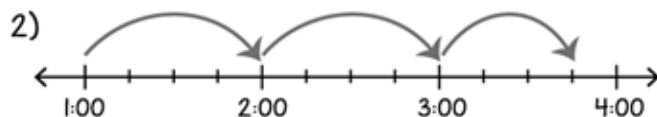


$$45 \text{ minutes} + 1 \text{ hour} = 1 \text{ hour and } 45 \text{ minutes}$$

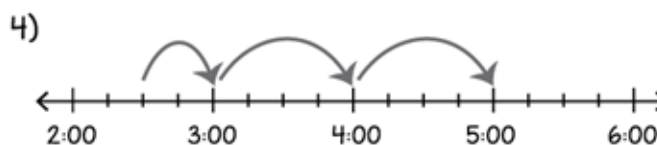
Next, give your child the "Elapsed Time on Number Lines" sheet, and tell him to read the information and follow the instructions to complete the sheet. If needed, he can watch the previous video again as he works or review the problems you worked with him.

"Elapsed Time on Number Lines" Answer Key

1) how long Cate was at her friend's house



3) 2 hours 45 minutes



5) 2 hours 30 minutes

Day 2**Activity 3: More Strategies for Elapsed Time**

Write 11:15 and 1:45 on the whiteboard. Say, "What if the start time is 11:15 and the end time is 1:45? What will you need to think about?" Help your child see that he'll have to count hours and minutes, and he will have to go past 12:00 in his counting. Say, "Remember that we can either begin measuring elapsed time with hours or minutes. Let's begin with a strategy called *start with elapsed hours*. What's one hour after 11:15?" (12:15) "What's another hour past 12:15?" (1:15) "So we've gone 2 hours. If we go another hour, we'll pass 1:45, right? Because that's too far, we now have to count in minutes. How many minutes will elapse between 1:15 and 1:45?" Your child should recognize that the elapsed time will be 30 minutes. He can use the geared clock as needed to see this. Say, "So we jumped 2 hours and 30 minutes from 11:15 to 1:45."

Erase the work you just did but keep the times on the board, 11:15 and 1:45. Say, "Another strategy you can use counts the minutes before the hours. This is called *match the minutes*. To match the minutes, you find out how many minutes pass from the minutes in the first time to the minutes in the second time. From there, counting the hours is easy. Let's try this with our example. The start time is 11:15. The end time shows 1:45. So, you find how many minutes it takes to go from 11:15 to 11:45. This matches the minutes of the start time to the minutes of the end time." Show your child how to move the minute hand from 11:15 to 11:45 first, and write "30 minutes" on the whiteboard. Now say, "How much time will pass between 11:45 and 1:45?" Give your child a chance to figure this out using the geared clock if needed. He should find that 2 hours pass. Write "2 hours" on the whiteboard. Say, "So we found out that 2 hours and 30 minutes, or two and a half hours, pass between 11:15 and 1:45."

Remind your child that he can also *use a number line* to find elapsed time. Model this strategy on the whiteboard by drawing a number line that begins at 11:00 and ends at 2:00. Help your child make the jump from 11:15 to 12:15 and from 12:15 to 1:15. Label these arcs as 1 hour each. Then show the jump from 1:15 to 1:45 and label this as 30 minutes. Add the times to get 2 hours and 30 minutes.

Now, give your child the "Elapsed Time Strategies" sheet, and tell him to work through the problem provided using each of the strategies: a number line, starting with hours, and match the minutes. Encourage him to use the geared clock as he works. After he has finished the problems, ask him which strategy he preferred. Remind him that having many strategies means that he can choose whichever one works best for each problem. Once your child has completed the "Elapsed Time Strategies" sheet, he can store it in his Interactive Notebook

Answer Key:

- The number line hours should be marked from 2:00 to 6:00. Quarter marks can be added if needed. Arrow arcs will show a jump from 2:45 to 3:00 (15 minutes), from 3:00 to 4:00 and from 4:00 to 5:00 (1 hour each), and from 5:00 to 5:15 (15 minutes). Together these add to 2 hours and 30 minutes.
- Starting with Hours:
2:45 to 3:45 = 1 hour
3:45 to 4:45 = 1 hour
4:45 to 5:15 = 30 minutes
Total elapsed time: 2 hours 30 minutes
- Match the Minutes:
2:45 to 3:15 = 30 minutes
3:15 to 4:15 = 1 hour
4:15 to 5:15 = 1 hour
Total elapsed time: 2 hours 30 minutes
- Your child's advice to Matt will vary but will likely involve being neater each day. Using the strategy of his choice, your child will find that Matt's cleaning time the next week was only 1 hour 15 minutes.

While your child works, write the following pairs of times (in the order given) on separate index cards:

- 2:30 and 6:45
- 7:45 and 9:30
- 4:55 and 10:00

Now, give him the index cards that you prepared while he worked on the sheet, and tell him to figure out the elapsed time for each pair of times using the strategies of his choosing. He can use the index cards themselves to show his work and can also use the geared clock as needed. When he finishes finding each elapsed time, ask him to explain how he did so, and discuss the possible strategies. For example, for the last pair, it might be easiest to work with elapsed hours to 9:55 and then add 5 minutes to get to 10:00. He should find the following answers:

- 2:30 and 6:45 (4 hour and 15 minutes)
- 7:45 and 9:30 (1 hour and 45 minutes)
- 4:55 and 10:00 (5 hours and 5 minutes)

Activity 4: Basic Skills Review

Your child will complete the "Basic Skills Review #6" sheet. Give him a scratch sheet of paper to use, and allow him to refer to his Interactive Notebook as needed.

Answer Key:

1. Kara started practicing piano at 2:00 and stopped at 3:30. How long did she practice? (1 hour 30 minutes)
2. Tom started dinner at 5:30. He ate for 30 minutes. What time did his dinner end? (6:00)
3. Mrs. Moneybags has 7 coins in her purse that total 73 cents. Which coins does she have in her purse? (2 quarters, 2 dimes, 3 pennies — other coin combinations may be possible)
4. Mrs. Moneybags has 10 coins in her purse that total \$1.17. Which coins does she have in her purse? (3 quarters, 3 dimes, 2 nickels, 2 pennies — other coin combinations may be possible)
5. $2097 > 2079$
6. $5742 + 139 = 5881$
7. $5742 - 139 = 5603$
8. The neighborhood recyclers collected 1209 cans in June. Then, they collected 1557 more in July. How many cans did they collect in all? (2766)

Wrapping Up

Conclusion

For additional practice with elapsed time, allow your child to answer questions at the following web link. If he is ready for a challenge, allow him to play the Time Hunter game instead.

Find the Change in Time I

www.movingbeyondthepage.com/link/6940/

Your child should complete 4 levels. The levels get increasingly challenging.

Time Hunter

www.movingbeyondthepage.com/link/9462/

First choose the play mode (desktop or touchscreen) and then choose "Elapsed Time" as the skill. Follow the instructions for game play. The top of the screen will provide an elapsed time problem, and your child will shoot the clock with the correct answer when he finds it.

Learning Gates

Have your child complete the Learning Gates quiz for this lesson on our iPad app or a web browser at www.movingbeyondthepage.com/online/.

Now and Later



example :

5 minutes later: 3:15
 20 minutes later: 3:30
 35 minutes later: 3:45
 50 minutes later: 4:00



10 minutes later: _____
 25 minutes later: _____
 30 minutes later: _____
 45 minutes later: _____



7 minutes later: _____
 20 minutes later: _____
 40 minutes later: _____
 60 minutes later: _____



30 minutes later: _____
 1 hour later: _____
 12 minutes later: _____
 1 hour and 15 minutes later: _____



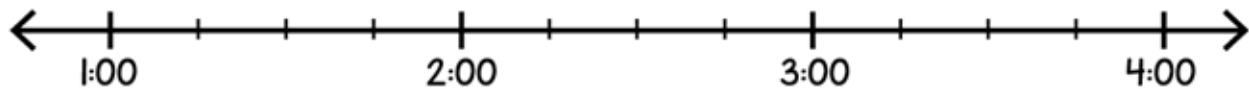
30 minutes later: _____
 60 minutes later: _____
 10 minutes later: _____
 2 hours and 3 minutes later: _____

Elapsed Time on Number Lines

PROBLEM: Cate went to her friend's house at 1:00. She returned home at 3:45. How long was Cate at her friend's house?

1) What are you trying to figure out? _____

2) Draw arrows on the number line below to show the elapsed time.
(Label the quarter minute marks if needed.)

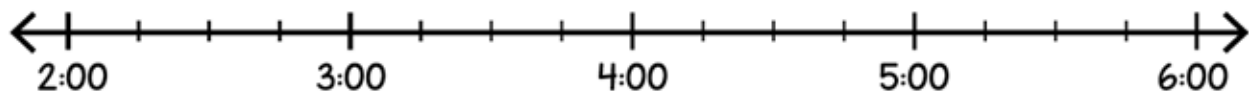


3) What's the answer to the problem?
_____ hours _____ minutes



PROBLEM: Joseph began working on his science project at 2:30, and he stopped at 5:00. How long did Joseph work on his project?

4) Draw arrows on the number line below to show the elapsed time. Be careful! Think about how many minutes pass between 2:30 and 3:00.
(Label the quarter minute marks if needed.)



5) What's the answer to the problem?
_____ hours _____ minutes

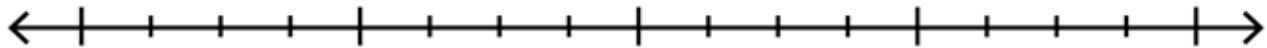


ELAPSED TIME STRATEGIES

Matt's room was very dirty and needed a good cleaning. He started cleaning it at 2:45 and finally finished at 5:15. How long did it take Matt to get this job done?



1 Use a number line. Be sure to label the hour and quarter hour marks. Draw arrows to show jumps in time.



2 Starting with Hours

2:45 to 3:45 = _____ hour

3:45 to _____ = 1 hour

4:45 to 5:15 = _____ minutes

Total elapsed time:

_____ hours _____ minutes

3 Match the Minutes

2:45 to _____ = 30 minutes

3:15 to 4:15 = _____ hour

4:15 to _____ = 1 hour

Total elapsed time:

_____ hours _____ minutes

Think about it! What advice would you give to Matt about his room?

Matt kept his room neater the next week. On cleaning day, he only had to work from 1:30 to 2:45. Using any method you want, find out how long it took Matt to clean the next week.