

# Space Adventures: Where Does the Time Go?

by John Perritano

## Math Objective

Children understand that time passes in agreed-upon units, such as seconds, minutes, hours, and days. Children convert these units of time and find equivalent amounts of time. They will use an analog clock, write and solve time subtraction problems, and use a number line diagram to show elapsed time.

## iMath Discover Activity

In this activity, children draw a four-column chart showing their favorite songs and how much time they take to play.

### ► Objectives

Children will:

- create a chart.
- time each song using a clock or watch.
- record the name of the song, its start and end time, and its elapsed time.
- select a strategy to find the elapsed time.
- find the total elapsed time for all four songs and for the length of the activity.

### Materials

- watch or clock with a second hand
- a radio, computer, iPod, or MP3 player
- paper and pencil

## Lesson Plan

### Before Reading

#### Investigation

pp. 4–5: Ask children to look at the picture on p. 4. Ask: *What do you know about the ISS or the International Space Station? Have you tried to find it in the night sky?* Read the text on p. 5. Ask: *Would you like to be a scientist on the ISS?*

#### Math Concepts

Connecting to what they know helps children engage in the topic.

*What would you study? Record children's answers on the board.*

*Say: It takes 90 minutes for the ISS to orbit Earth? That's really fast—17,000 miles per hour. How fast does a car usually go? You can use the Internet to find out where to look for the ISS in the night sky. It is brighter than a star. Have children go to <http://spacestationlive.nasa.gov/> and explore the ISS live!*

Accessing prior knowledge gets children to think about and engage with the topic. Check children's understanding.

In this book, children learn what it's like on the International Space Station and understand that keeping track of time is important in and out of this world.

## During Reading

### Investigation

pp. 6–9: Have children read these pages silently. Then, reread pp. 6–7 aloud or have a volunteer do so. Provide an old analog clock. Let children experiment with showing elapsed time using the clock and moving its hands forward. Have them demonstrate the elapse of the times listed in the chart on p. 7. Then ask: *What does it mean to convert units of time? How many seconds are in a minute? How many minutes are in an hour?* Reread p. 8 aloud. Say: *Let's write the regrouping chart on the board. We cannot take 50 minutes from 45, so we will need to take an hour from the hour column and add it to the minutes column. One hour is 60 minutes. We add those minutes to the 45 already in the minutes column. That gives us 105 minutes. Now we can do the subtraction problem to find an elapsed time of 2 hours 55 minutes.* Reread p. 9 aloud. Have a volunteer draw the number line diagram on the board. Say: *We could count 4 and a half hours forward in our heads. But let's try using the number line.* Invite a volunteer to count forward 4 and a half hours using the number line.

### Math Concepts

Children tell and write time to the nearest minute and measure time intervals in minutes. They solve word problems involving addition and subtraction of time intervals in seconds, minutes, hours, days, e.g., by representing the problem on a number line diagram, a chart. Children use an analog clock to figure out elapsed time.

## During Reading (continued)

## Investigation

pp. 12–15: First, have children read these pages silently. Reread p. 12–13 aloud. Invite a volunteer to tell how they would solve the “Did You Know problem” by converting hours to days. Then, have children copy the chart on the bottom of p. 13 and fill in the missing information. Draw the chart on the board and let children tell you how to fill it in. Reread pp. 14–15 aloud. Have children find the total time the scientist worked in all using the chart at the bottom of p. 15.

pp. 16–17: Have children read these pages silently. Reread pp. 16–17 aloud. Ask: *What kind of experiment would you want to conduct in space?* Write children’s answers on the board. Then, using the chart on p. 17, have children find the total time the students worked designing their experiment.

pp. 18–21: Have children read pp. 18–21 silently. Reread pp. 18–19 aloud. Have children discuss the text. Ask: *Can you imagine both your food and your body floating in space while you try and eat? What are some foods you think would work well in space? Why?* Record children’s answers on the board. Then, have them work the problem at the bottom of p. 19. Have children check each other’s work. Ask: *What strategies did you use to solve the problems?* Have volunteers come to the board to show how they arrived at their answers. Reread pp. 20–21 aloud. Ask: *Why do astronauts on the ISS have to exercise?* Have children work the problems at the bottom of p. 21. Have a volunteer use the analog clock to show how to find the elapsed time.

pp. 22–24: Have children read pp. 22–24 silently. Then, reread p. 22 aloud. Have children discuss the text. Ask: *What instrument would be fun to play in space? Why?* Work the problem on the bottom of p. 22 with children. Demonstrate how to convert the answer into hours and minutes. Then, reread p. 23 aloud. Ask: *Do you think you could sleep in space? How many hours a night do you sleep on Earth?* Have children use a number line diagram to work the problem on the bottom of p. 23. Have children refer back to

## Math Concepts

Children solve real-world and mathematical problems by converting units of time, finding elapsed time, and using addition and subtraction.

Children access their own knowledge and apply it. Children solve real-world math problems by converting units of time and using addition and subtraction.

Children tell, read, and write time to the nearest minute and measure time intervals in minutes and hours. They solve word problems involving addition and subtraction of time intervals in seconds, minutes, hours, days, e.g., by representing the problem on a number line diagram or a chart. Children use an analog clock to figure out elapsed time.

Children solve real-world math problems by converting units of time and using addition, subtraction, and division. They understand how to use a number line diagram.

p. 9. Reread p. 24. Encourage children to convert units of time and divide.

### During Reading (continued)

#### Investigation

pp. 25–27: Read the p. 25 aloud. Ask: *Why is training underwater good practice for astronauts?* Read pp. 26–27 aloud. Let the children answer the questions and solve the problems on these pages. Have children discuss their strategies for solving each problem. Suggest other ways they might have approached the problem.

pp. 28–29: Read p. 28 aloud. Ask: *Do you think that Idea 3 is the best way to solve this problem? How would you solve the problem?* Have children write and solve the problem using pencil and paper. Check children’s understanding. Read p. 29 together. Work with children to help them think about how they can approach their design and build their model. Provide drawing materials and graph paper.

#### Math Concepts

Children tell, read, and write time to the nearest minute and measure time intervals in minutes and hours. They solve word problems involving addition and subtraction of time intervals in seconds, minutes, hours, days, e.g., by representing the problem on a number line diagram or a chart. Children use an analog clock to figure out elapsed time.

Children reason and select the best strategy to solve the problem. Children plan and engineer materials to create a design and model for a space station.

### After Reading

Ask children to restate the key ideas in the book.

#### Investigation

Have children keep track of their schedule over the course of a day. Have them chart start and finish times. Then, have them total the time spent on individual activities.

Encourage children to write a short mystery story that takes place in space. Have them use time clues to set up the plot for their story.

#### Understanding Math

Children tell, read, and write time to the nearest minute and measure time intervals in minutes and hours. Children understand how to write a schedule log to show start and finish times. They understand how to find total elapsed time.

Children use addition and math and elapsed time clues to lay the framework for a mystery story.