Grade 4 Mathematics
Measurement: Lesson 4

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students will have an arrow symbol (⇨) by them.

Purpose of Lesson 4:

- In this lesson, the tutor and the students will
  - ✓ read temperature measurements,
  - ✓ estimate temperatures,
  - ✓ measure elapsed time, and
  - ✓ choose the best unit to measure time.

Materials/Equipment Needed:

- Copies of Student Sheets 44 – 46
- Paper and pencils

Preparations before beginning Lesson 4:

- Run off 1 copy of Student Sheets 44 – 46 for each student.
- Have paper and pencils available.

Lesson 4: Measurement

This lesson is about temperature and time.

Say:

When would you need to measure the temperature? (To know what to wear, to bake a cake, to see whether you have a fever) **What kind of tool do we use to measure temperature?** (Thermometer) **What units are used to measure temperature?** (Customary – Fahrenheit degrees, Metric – Celsius degrees)

Can you give me some well-known Fahrenheit (F) temperatures? (Water freezes at 32°F and boils at 212°F; normal body temperature is about 98 – 99°F; 90°F is hot outside; 40F° is cold) **I am going to ask you some questions about temperature. Be ready to defend your answers.**

A. Should a bowl of hot soup be 50°F or 110°F? (110°F)

B. The weather forecaster says the temperature will be 30°F. Should you wear a coat? (Yes)

C. Byron has a temperature reading of 100°F. Does he have a temperature? (Yes)

D. If I am going to bake a cake, should I set the oven to 35°F or 350°F? (350°F)

⇨ Move to the metric system.

Say:

Can you give me some well-known temperatures in degrees Celsius? (Water freezes at 0°C and boils at 100°C; temperatures in the 40°'s are hot; temperatures in the teens are cold) **I am going to ask you some questions about temperature measured in metric units.**

A. Would you like an ice cream cone that had been stored at 30°C or at –5°C? (–5°C)

B. The weather forecaster says the temperature will be 30°C. Should you wear a coat? (No.)

C. Would you like your bowl of hot soup heated to 50°C or 20°C? (50°C)

⇨ Give students Student Sheet 44. One of the problems that students have in reading a thermometer is that the scales look different. Some show every degree, but label only every 10^{th}. Some show every degree, but label every 5^{th}. Some show the degrees by 2's, 5's, etc. Here are some hints. On scales 1 and 2, every degree has a mark; but only every 5^{th} degree is labeled.

Students should count by 1's. On scales 3 and 4, every 5^{th} degree is marked and every 10^{th} degree is labeled. The students will have to count by 5's. On scales 5 and 6, every 10^{th} degree is marked; but every mark is labeled, so all they have to do is read the scale.

Say:

On Student Sheet 44, there are pictures of different thermometers. What is the temperature? You may have to help them with each scale.
Answers:

1) 10°C	2) 16°F	3) 40°C	4) 25°F
5) 20°C	6) 40°F		

This section will discuss time.

Say:

When would you want to measure time? (To see how much longer class is, to decide when recess will be, how long to bake cookies, when your favorite TV program comes on, etc.) **What kind of tools do you use to measure time?** (clocks, calendars) **What units do you use to measure time?** (minutes, years, months, days, seconds, hours, weeks) **Let's put the units of time in order from smallest to largest**. (second, minute, hour, day, week, month, and year) I am going to ask some questions about time. **Which unit would you use to measure the following time periods?**

A. The length of a flight from New Orleans to New York (hours)
B. How much TV you watch a night (minutes or hours)
C. How long you sleep each night (hours)
D. How long it takes to become a teacher (years)
E. How long it takes to blink an eye (seconds)

⇨ Give Student Sheet 45 to students. This sheet will show whether they can tell time. It also introduces them to elapsed time. Elapsed time is time that has passed: for example, from 8:00AM to 8:30 AM, 30 minutes have elapsed, or passed. Elapsed time is a difficult concept for students. The paragraph below will give you some ideas for questions.

Say:

We are going to start with the first 3 clocks on this sheet. Write the time that each clock is showing. 1) 11:20 2) 6:45 3) 10:45. **For problems 4 – 6, what time would be shown on the clock 1 hour later?** 4) 12:20 5) 7:45 6) 11:45. For problems 7 – 9, go back to clocks 1 – 3. **What time would be shown on each clock 30 minutes later?**

7) 11:50 (Count by 5 minutes for 30 minutes from the 20 minutes.) 8) 7:15 (Some will think it takes 15 minutes to get to 7 and then 15 more minutes) 9) 11:15. **Let's now look at the clocks in problems 10 – 12. Since these are a little hard to read, we will estimate the times. Allow them time to discuss.** 10) 12:35 11) It is either 2:52 or 2:53. Either is fine. 12) It is about 6:17 or 6:18. **For problems 13 – 15, what time would be shown on each clock in 2 hours.** 13) 2:35 14) 4:52 or 4:53 15) 8:17 or 8:18

⇨ Go back to clock 1 on this sheet.

Say:

What time is shown on clock 1? (11:20) How long would it take to drive to the game if you arrived at 12:40? (Allow students to talk about the ways that they could find the amount of time that elapsed.) **What do you need to find?** (the amount of time from 11:20 to 12:40) **Why don't you look at the hours first and then the minutes? Count the hours: from 11:20 to 12:20 is one hour. Count the minutes: 25, 30, 35, 40. This count was four counts of 5 or 20 minutes. It would take 1 hour and 20 minutes.**

⇨ Give Student Sheet 46 to students.

Say:

You can use the clocks on this sheet to help you answer the following questions. Draw the times on the clocks. Draw the first time that I say on the top clock. Draw the second time on the bottom clock. I will read the problems to you.

1. You put a cake in the oven at 8:15. You take it out at 8:55. How long did it take to bake the cake? (40 minutes)

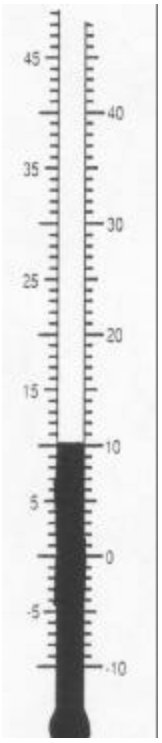
2. The school play started at 1:35 and was over at 3:45. How long was the play? (1:35 to 3:35 is 2 hours. Count the minutes from 3:35 to 3:45: 10 minutes. It took 2 hours and 10 minutes.

3. Nancy started jogging at 7:45 and quit at 8:12. How long did she jog? (7:45 to 8:00 is 15 minutes; 8:00 to 8:12 is 12 minutes.
15 + 12 = 27 minutes)

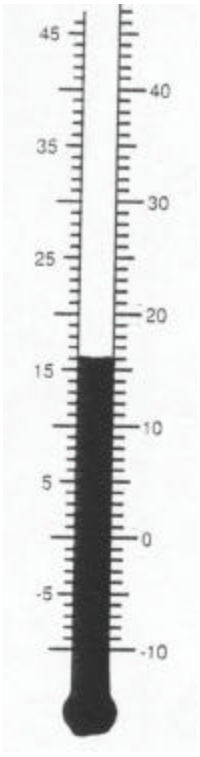
⇨ Have one student summarize today's lesson.

Student Sheet 44 (Measurement: Lesson 4)

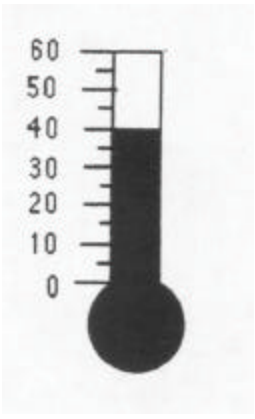
Read each thermometer. What temperature is shown?

1. 

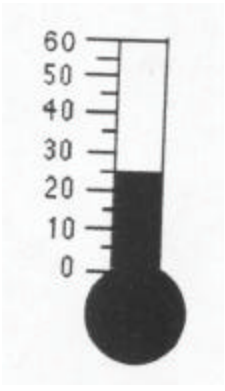
_____° C

2. 

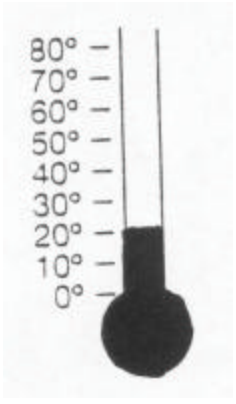
_____° F

3. 

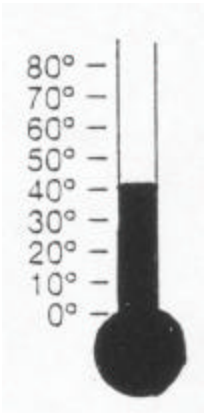
_____° C

4. 

_____° F

5. 

_____° C

6. 

_____° F

Student Sheet 45 (Measurement: Lesson 4)

What time does each clock show? Write the time on the line below each clock.

1. 

2. 

3. 

1._____ 2._____ 3._____

For each clock above (1–3), write the time one hour later.

4._____ 5._____ 6._____

For each of the clocks above (1–3), write the time 30 minutes later.

7._____ 8._____ 9._____

Approximately what time does each clock show?

10._____ 11._____ 12._____

For each clock above (10–12), write the time two hours later.

13._____ 14._____ 15._____

Student Sheet 46 (Measurement: Lesson 4)

1. 2. 3.