Name:_____

Review of Weight

Check the correct answer.

1) To change pounds to ounces multiply ☐ divide ☐

2) To change tons to pounds multiply ☐ divide ☐

3) To change grams to kilograms multiply ☐ divide ☐

4) To change grams to millograms multiply ☐ divide ☐

Write TRUE or FALSE.

_____ 1) When you change pounds to ounces, you divide.

_____ 2) Four pounds are equal to 64 ounces.

_____ 3) When you change kilograms to grams you divide.

_____ 4) One thousand milligrams equals 10 grams.

_____ 5) Six tons are equal to twelve thousand pounds.

Think About It

1) When might you need to know the weight of an object?

_____

2) When is it important to know the exact weight of an object?

_____

When is an estimate enough?

_____

3) Why would you **not** use a ton to measure things in every day life?

_____

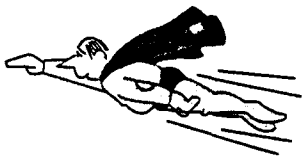
Which units of measure would be better to use? Why?

_____

4) Which unit of measure would you use to weigh your dog? Explain why.

_____

Matching with Tons and Fractions



____ 1)	4,000 lbs	a) 1 ton
____ 2)	2,000 lbs	b) $\frac{3}{4}$ ton
____ 3)	1,000 lbs	c) $1\frac{1}{2}$ tons
____ 4)	1,500 lbs	d) 2 tons
____ 5)	3,000 lbs	e) $\frac{1}{2}$ ton

Name _____

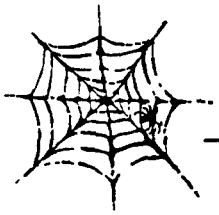
Which Is It? Ounces, Pounds, Tons, Grams, or Kilograms?

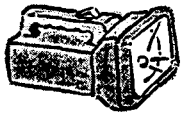
Part 1. Which measurement would you use to weigh the following objects? Write **ounces, pounds,** or **tons.**

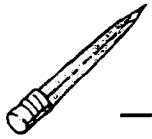
1. a laptop computer _____ 

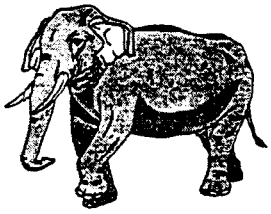
2. a can of tuna  _____

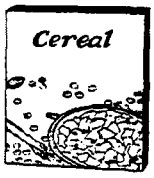
3. a loaf of bread _____ 

4. a spider web  _____

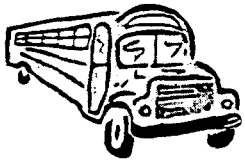
5. a large flashlight _____ 

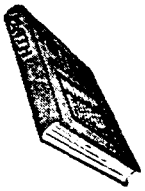
6. a pencil  _____

7. an elephant _____ 

8. a box of cereal 

_____

9. a school bus _____ 

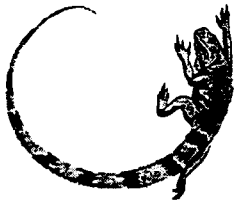
10. a textbook  _____

Part 2. Which measurement would you use to weigh the following objects? Write **grams** or **kilograms.**

1. a <u>full</u> bookbag  _____

2. an <u>empty</u> backpack _____ 

3. a clove of garlic  _____

4. an iguana _____ 

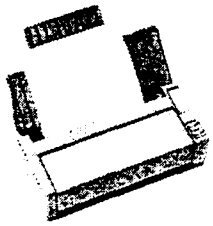
5. a can of soup  _____

6. a paperback book _____ 

7. a boom box  _____

8. a pair of scissors _____ 

9. a child  _____

10. a computer printer _____ 

Answer Key
Measurement - Obj. 6

What Do We Use to Measure . . .? (grams or kilograms)

1) grams
2) kilograms
3) grams
4) kilograms
5) grams
6) kilograms

Converting Weight in the Metric System

1) 8000 g	multiply	5) 12,000 g	multiply
2) 2 kg	divide	6) 15 kg	divide
3) 8 kg	divide	7) 500 g	multiply
4) 30,000 g	multiply	8) .005 kg	divide

More Practice with Weight in the Metric System

Page 1
Circle the measurement.

1) 1 g
2) 100 g
3) 450 kg
4) 1200 kg
5) 15 kg

Problem Solving

1) 4.5 kg
2) 675 g
3) Use 15kg and 10kg , add 1kg weight to the apples

Page 2
Put these weights in order from *greatest* to *least.*

a) 500 g b) 600 g c) 6 g
Order - b, a, c

a) 1 kg b) 1.58 kg c) 1.5 kg
Order - b, c, a

Measurement Comparisons

1) >
2) =
3) <
4) =
5) >
6) <

What Do We Use to Measure . . .? (ounces, pounds, or tons)

1) oz
2) lb
3) lb
4) oz
5) oz
6) oz
7) T

Converting Weight in the Customary System

1) 416 oz multiply
2) 2 lb divide
3) 48 oz multiply
4) 2 T divide
5) 6000 lb multiply
6) 5 lb divide
7) 5 T divide

Converting with Remainders

1 = 16 2 = 32 3 = 48 4 = 64 5 = 80
6 = 96 7 = 112 8 = 128 9 = 144 10 = 160

Change the units of weight.

32 oz = 2 lbs 3 lbs = 48 oz 41 oz = 2 lbs 9 oz
5 lbs = 80 oz 10 lbs = 160 oz 144 0z = 9 lbs
66 oz = 4 lbs 2 oz 170 oz = 10 lbs10 oz 5 lbs11 oz = 91 oz

Practice Converting in the Customary System

Page 1
Which would you use to measure? a, b, b, b, a

Complete:

1) 128 oz 4) 3 T
2) 8000 lbs 5) 5000 lbs
3) 5 lbs 4 oz 6) 81 oz

Put the balls in order from lightest to heaviest. A, C, B A, C, B B, A, C

Page 2
Compare these measures.

1) > 4) =
2) = 5) <
3) >

Problem Solving

1) pounds - ounces too few, tons too many
2) 4 lbs 6 oz
3) 24 lbs 2 oz, 26 lbs 8 oz

Review of Weight

Page 1
Check the correct answer.

1) multiply 3) divide
2) multiply 4) multiply

Write True or False

1) F 4) F
2) T 5) T
3) F

Think about it. (Answers will vary)

1) Doctors office- your weight
   Weighing fruit at the market
2) When paying by the oz or lb
   When lifting or moving an object
3) Tons measure only very heavy objects. We can use ounces and pounds for everyday measuring.
4) Pounds - ounces are too small, tons way too big

Matching with Tons and Fractions

1) D 2) A 3) E 4) B 5) C

Which Is It? Ounces, Pounds, Tons, Grams, or Kilograms?

Ounces, Pounds, or Tons

1) pounds
2) ounces
3) ounces
4) ounces
5) pounds
6) ounces
7) tons
8) ounces
9) tons
10) pounds

Grams or Kilograms

1) kilograms
2) grams
3) grams
4) grams
5) grams
6) grams
7) kilograms
8) grams
9) kilograms
10) kilograms

Objective 7: Compare the volumes of given objects using concrete materials (rice, dried beans, water, etc.). Estimate and measure liquid volume in customary and metric units (cups, pints, quarts, gallons, liters) including the concepts of more, less, and equivalent.

Vocabulary

cup
pint
quart
gallon
equal
capacity
milliliter
liter
liquid
solid
label

Materials

containers of various sizes and shapes
filler material (e.g. rice, dried beans, popcorn kernels, etc.)
scooper
colored pencils/crayons
blank paper
rulers

Transparencies:

- Equivalency Graphic
- Conversion Chart
- Capacity Challenge
- What Would You Use- Cup, Pint, Quart or Gallon?
- What Would You Use-Milliliter or Liter?

Student Copies:

- What Would You Use- Cup, Pint, Quart, or Gallon
- Tables of Measurement for Capacity
- Capacity Challenge
- Capacity - Customary Units Practice
- What Would You Use - Milliliter or Liter?
- Capacity - Metric Units Practice
- Problem Solving - Capacity
- The Language of Capacity
- Cube Template

Language Foundation

1. The vocabulary will be taught as part of the lesson. **Non-standard units** refers to any container which does not have measurement increments indicated on it. **Customary units** refers to those units traditionally used in the United States i.e. cups, pints, quarts and gallons. **Metric units** refers to milliliters and liters.

2. Explain that the prefix "**milli**" means thousand. i.e. millennium, millipede For Spanish speaking students, this should be very familiar since the word for thousand in Spanish is "mil."

3. You may need to review comparative and superlative which was covered in Measurement Obj. 2. Remind students that the suffix "er" is used when comparing two objects and "est" is used when comparing three or more objects. i.e. larger, largest, smaller, smallest.

4. Some students may not be familiar with abbreviations. Tell students abbreviations are shortened forms of words. Reference could be made to the days of the week or the months of the year which students most likely have learned by this point. i.e. Sunday = Sun. October = Oct. Ask students what other abbreviations they know. (USA, Mrs., FCPS, Va.)

5. **Capacity** is the maximum amount that an object can hold. **Volume** is the number of cubic units it takes to fill a solid. Tell students that volume and capacity are different words for the same idea.

Mathematics Component

1. Explore and define **capacity** using nonstandard measures.
   - On a table place 2 containers of different **capacity** but with similar shapes. Have a filler (rice, dried beans, water, popcorn kernels, etc.) and a scooper on the side.
   - Show the students two different containers.
   - Ask them which one can hold the most *rice (the filler is up to you).* If you can, choose containers that hold similar amounts but are shaped differently. Have the class try to agree on one answer.
   - Ask students how we can find out which one holds the most *rice.* Have a student fill each container, counting out loud the number of scoops.
   - After they have showed you which one holds the most, hold the container up and tell them that this container has the **larger capacity.** Hold the other container up and say it has the **smaller capacity.**
   - Write **capacity** on the board.
   - Tell them that **capacity** is the amount a container can hold when it is filled. Show them the filled containers again.

2. Estimate and compare **capacity** using nonstandard measures.
   - Divide students into small groups.
   - For each group of students, gather several containers of different shapes and sizes, scoopers and something to fill the containers with (rice, dried beans, popcorn kernels, water, etc.)
   - Give each group 4 different containers. Vary the shapes and sizes.
   - Have the students arrange the containers from **smallest** to **largest capacity.** You may need to explain **capacity** again.
   - Have them label the containers from 1 - 4 (1 being the smallest) using post-it notes.
   - Ask how can they find out if their order correct. They can demonstrate if their language is limited.
   - Give each group of students a scooper and something to fill the containers with.
   - Have groups fill each of their containers and record results on post-it notes already on containers. When finished, rearrange the containers from **smallest** to **largest capacity.**
   - When all groups have finished discuss what they found. For example, did the **tall** container hold the most? (Tailor your questions to the language needs of your students.)
   - Conclude discussion with students telling or showing what **capacity** means.

3. Estimate and measure in Customary Units.
   - Gather *containers that hold a* **cup**, *a* **pint**, *a* **quart**, *and a* **gallon**. Also have a few different liquids (water, coffee, soda, juice) and a few different non-liquid foods (granola bar, apple, bread).
   - Tell the students that we will measure **capacity** using customary units - units used in the United States.

- Tell students **cups, pints, quarts,** and **gallons** are used to measure **liquid capacity.** Liquid capacity means how much liquid a container can hold. You will need to explain **liquid.** Show them the different **liquids** and then show them food that is not **liquid.** Tell students these are **solids.** Ask them to verbalize the difference if possible and to name other **liquids** and **solids.**

Gallons

- Show students a **gallon** container.
- Tell them that this container holds **1 gallon.**
- Write **gallon** on the board. Write the abbreviation **(gal)** on board and explain.
- Ask students what type of material **(solid or liquid)** they would measure using gallons. You might have to point to a **solid/liquid** and have students indicate the **liquid.**
- Show some common containers that hold a **gallon** (a **gallon** milk jug, a **gallon** bucket, etc.)
- Tell students a **gallon is used** to measure large **liquid** quantities. Ask for examples of objects that hold more than a **gallon.** (bathtub, swimming pool, fish tank) If you can, show pictures of these objects and other objects that are measured in gallons.

Quarts

- Show students a **quart** container.
- Tell them that this container holds **1 quart.**
- Write **quart** and the abbreviation **(qt)** on the board.
- Show some containers that hold a **quart.**
- Ask students to guess how many **quarts** are in a **gallon.**
- Show them by filling a **quart** with water and pouring it into a **gallon** container. Count as you pour each **quart.** Ask again how many **quarts** are in a **gallon.** (4)
- Write **1 gallon = 4 quarts** on the board.

Pints

- Show students a **pint** container.
- Tell them that this container holds **1 pint.**
- Write **pint** and the abbreviation **(pt)** on the board.
- Show some containers that hold a **pint.**
- Ask students to guess how many **pints** are in a **quart.**
- Show them by filling a **pint** with water and pouring it into a **quart** container. Count as you pour each **pint.** Ask again how many **pints** are in a **quart.** (2)
- Write **1 quart = 2 pints** on the board.

Cups

- Show students a 1 **cup** measuring cup.
- Tell them that this is **1 cup.**
- Write **cup** and the abbreviation **(c)** on the board.

- Show some containers that hold a **cup.**
- Ask students to guess how many **cups** are in a **pint.**
- Show them by filling a **cup** with water and pouring it into a **pint** container. Count as you pour in each cup. Ask again how many **cups** are in a **pint.** (2)
- Write **1 pint = 2 cups** on the board.
- To review, show students containers that hold exactly a **cup,** a **pint,** a **quart** and a **gallon.** Ask students to identify which container holds a cup, a pint, a quart and a gallon.

- Display some different household containers of various sizes. (jars, cans, glasses, etc.)
- Hold up the smallest household container. Ask students which customary unit **(cup, pint, quart** or **gallon)** would be the best measuring unit for finding out the capacity of the container. **(cup)** (Hold up the cup, pint, quart and gallon containers so students have a reference.)
- Have students estimate the number of **cups** to fill the container. Record the estimates on the board. Have a student pour water, using a cup measure at a time to find the exact **capacity** of the container.
- Repeat this procedure with several other household containers until students understand estimating and measuring with **cups.**
- Display a container that has a **capacity** of more than 2 **cups.** Ask students what customary unit, besides a cup, could be used to measure the capacity of this container. Elicit a **pint.**
- Display a container that has a **capacity** of more than 2 **pints.** Ask students what customary unit, besides a pint, could be used to measure the capacity of this container. Elicit a **quart.**
- Display a container that has a **capacity** of more than 4 **quarts.** Ask students what customary unit, besides a quart, could be used to measure the capacity of this container. Elicit a **gallon.**
- Show students containers of different sizes (You can use the same containers as before but change the order). Ask students what customary unit **(cup, pint, quart or gallon)** would be the best to measure the **capacity** of the container. Have students verbalize reasoning if their language allows. Some students might demonstrate to explain their reasoning.
- Distribute What Would You Use - Cup, Pint, Quart or Gallon?. Complete some problems together. Have students finish individually or in pairs.

4. Reinforce the equivalency of liquid measures.
   - Give students blank paper, rulers, and 4 different colored pencils/crayons.
   - Tell them they are going to make a drawing to help them remember how many **quarts** are in a **gallon,** how many **pints** are in a **quart,** and how many **cups** are in a **pint.**
   - Display the transparency Equivalency Graphic, leaving only the **gallon** box visible to students.
   - Instruct students to make a large box like the one at the top of the paper and write **gallon** in the box. Ask why **gallon** is at the top. (It has the **largest capacity.**)
   - Hold up the quart and gallon containers. Ask students if anyone remembers how many **quarts** are in one **gallon.** (4) Uncover the **quart** section of the transparency and have the students

make 4 boxes and connecting lines. Have them write **quart** in each one.

- Hold up the pint and quart containers. Ask students if anyone remembers how many **pints** are in a **quart**. (2) Uncover the **pint** section of the transparency and have the students make 8 boxes and connecting lines. Have them write **pint** in each box.
- Hold up the cup and pint containers. Ask students if anyone remembers how many **cups** are in a **pint**. (2) Uncover the **cup** section of the transparency. Have students draw 16 boxes and connecting lines. Have them write **cup** in each box.
- Have students color each section a different color (**gallon** - blue, **quarts** - red, etc.).
- Ask students questions about **capacity** equivalency. Start off with simple questions. (How many **pints** are in 1 **quart**?) and progress through more difficult questions. (How many **cups** in 2 **pints**? and How many **cups** in 1 **quart**?) Show students how to use their chart to help them answer the questions.

5. Develop a table of conversion.
   - Put transparency Conversion Chart on overhead.
   - Fill out the chart with students. Have students refer to Equivalency Graphic while completing the chart. (Students will get a copy of the conversion chart on Tables of Measurement for Capacity.)

Larger to Smaller

- On the transparency, display only the larger to smaller chart, **gallons** to **quarts** section.
- Hold up a gallon container and a quart container. Ask students which is larger - a **gallon** or a **quart**. (**gallon**)
- Tell students there is 1 **gallon** of milk. Ask them how many **quarts** of milk there are. (4) Tell them for every 1 **gallon** of a liquid there are 4 **quarts** of the liquid.
- Tell students to go from larger (**gallon**) to smaller units (**quarts**) , multiply because there are more of the smaller units, in this case quarts. Ask them what number you would multiply by to go from **gallons** to **quarts**. (Multiply the number of gallons by 4.) You might have to prompt students by asking the number of quarts in a gallon.
- Write **x 4** in the chart.
- Ask students to find the number of **quarts** in 2 **gallons**. (2 x 4 = 8) Remind them that to convert from **gallons** to **quarts,** you multiply the gallons by 4.

- Hold up a quart container and a pint container. Ask which is larger - a **quart** or a **pint**? (**quart**)
- Uncover **quarts** to **pints** on the overhead conversion chart. Ask how many **pints** are in a **quart**. (2)
- Tell students that to go from larger (**quart**) to smaller (**pints**), you multiply because there are more of the smaller units (**pints**). Ask what number you multiply by to go from **quarts** to **pints.** (Multiply the number of quarts by 2.) You might have to prompt students by asking them the number of **pints** in a **quart**.

- Write **x 2** in the chart.
- Ask students the number of **pints** in 2 **quarts**. (2 quarts x 2 = 4) Remind them that to convert from **quarts** to **pints** you multiply by 2.

- Hold up a pint container and a cup container. Ask which is larger - a **pint** or a **cup**. (**pint**)
- Uncover **pints** to **cups** on the overhead conversion chart. Ask students how many **cups** are in a **pint**. (2)
- Ask students which operation you would use to convert from **pints** to **cups**. (multiplication) Ask what number you would multiply by to go from **pints** to **cups**. (Multiply the number of pints by 2.) You might have to prompt students by asking the number of **cups** in a **pint**.
- Write **x 2** in the chart.
- Ask students how many **cups** in 3 **pints**. (3 pints x 2 =6) Remind them that to convert from **pints** to **cups**, you multiply by 2.

Smaller to Larger

- On the transparency, display only the **cups** to **pints** section. Tell students units will now be converted from smaller to larger. Ask them if they will convert the same way they did when the conversion was from larger to smaller units. Elicit no.
- Ask students if anyone can explain how the conversion might be made from smaller units to larger units. (divide)
- Hold up a cup container and a pint container. Ask students which is smaller, a **cup** or a **pint**. (**cup**)
- Ask students how many **cups** are in a **pint**. (2)
- Tell students that to go from smaller units (**cups**) to larger units (**pints**), divide because you have fewer of the larger units, in this case **pints**. Ask what number you divide by to convert from **cups** to **pints**. (Divide the number of cups by 2.) You might have to prompt the students by asking them how many **cups** are in a **pint**.
- Write ÷ **2** in the chart.
- Ask students how many **pints** are in 4 **cups**. (4 cups divided by 2 = 2) Remind them that to convert from **cups** to **pints**, divide by 2.

- Hold up a pint container and a quart container. Ask students which is smaller, a **pint** or a **quart**. (**pint**)
- Uncover the **pints** to **quarts** section on the overhead chart.
- Ask students how many **pints** are in a **quart**. (2) Tell students that to go from smaller units to larger units, divide. Ask what number you would divide by to convert from **pints** to **quarts**. (2) You might have to prompt students by asking them how many **pints** are in a **quart**.
- Write ÷ **2** in the chart.
- Ask how many **quarts** are in 8 **pints**. (8 pints divided by 2 = 4) Remind them that to convert

pints to **quarts**, divide the number of pints by 2.

- Hold up a quart and a gallon container. Ask which is smaller, a **quart** or a **gallon. (quart)**
- Uncover the **quarts** to **gallons** section on the overhead chart.
- Ask how many **quarts** are in a **gallon.** (4) Ask which operation they would use to convert from **quarts** to **gallons** or from smaller units to larger units. (division)
- Ask what number they would divide by to convert from **quarts** to **gallons.** (Divide the number of quarts by 4.) You might have to prompt students by asking them how many **quarts** are in a **gallon. (4)**
- Write **÷ 4** in the chart.
- Ask how many **gallons** are in 8 **quarts.** (8 quarts divided by 4 =2) Remind students that to convert **quarts** to **gallons**, divide the number of quarts by 4.
- Ask students some conversion questions (8 **pints** = ? **quarts**, 6 **pints** = ? **cups**, 6 **cups** = ? **pints**, 3 **gallons** = ? **quarts**, etc.). The chart should be used as a reference when answering.

- Pass out Tables of Measurement for Capacity. Go over the customary units and conversion charts again. Tell students metric units will be explained later.
- Pass out Capacity Challenge. Make an overhead for yourself. Using Tables of Measurement for Capacity and/or the Equivalency Graphic, work together to complete Part A on Capacity Challenge.
- Do the first 2 problems on Part B together. Have them finish in pairs.
- Tell students to keep Equivalency Graphic and Tables of Measurement for Capacity in their math binders to use as reference.
- The activity sheet Capacity - Customary Units Practice may be used to provide additional practice for students.

6. Estimate and measure in Metric Units.
   - Gather containers that hold a **liter** (liter soda bottle) and a **milliliter** (eyedropper).
   - Tell students we can also measure **capacity** with **liters** and **milliliters.** Ask what the system of measurement using **liters** and **milliliters** is called. (metric)
   - Show a **liter** container, like a water bottle, and say that it holds one **liter.** Write **Liter** and the abbreviation **(L)** on the board.
   - Ask which is closer to a **liter** - a **cup**, a **pint**, a **quart** or a **gallon.** (Have these containers out so they can see.) Elicit a **quart.**
   - Show students an eyedropper. Tell them that the eyedropper holds 1 **milliliter.** Write **milliliter** and the abbreviation **(mL)** on the board.
   - Ask students to guess how many **milliliters** are in 1 liter. Record their estimates on the board. Say that **1000 milliliters = 1 liter.** Write this on the board.

- Show them several containers (a glass, a spoon, a big bucket, etc.) and ask what they would use to measure the **capacity** of these containers - a **milliliter** or a **liter.**
- Pass out What Would You Use - Milliliter or Liter?. Go over a sample problem together. Have students finish individually or in pairs.
- The activity sheet Capacity - Metric Units Practice may be used to provide more practice with the metric system of measurement.

7. Problem Solving

- Pass out Problem Solving - Capacity. Tell students they can use their Equivalency Graphic and/or Tables of Measurement for Customary Units to help them. Tell students the answer to word problems must have a **label,** which is a word identifying the answer. For example, 6 quarts or 6 qt, not just 6. Tell students to be sure to label their answers.
- Do the first problem together. Have students complete the rest of the problems with a partner.

Additional Activities

- Have students make a book or cube demonstrating the customary and metric units of measuring capacity. Have them illustrate containers that measure about a **cup, pint, quart, gallon, milliliter,** and **liter.** For example on a cube: 1 side - **cup,** 1 side - **pint,** 1 side - **quart,** 1 side - **gallon,** 1 side - **liter,** and 1 side - **milliliter.** Work may be done on computer using graphics or a drawing program to make the illustrations and measurement labels. A Cube Template, which may be enlarged, is provided.

- As a culminating activity, show the students a big jug. Ask students, "How many **liters** are in this jug? How many **cups, pints, quarts** and **gallons?"** Have students write down their estimates on a piece of paper. As a class, measure to determine the actual **capacity** of the jug. If you wish, award a prize to student with closest estimates.

Name _____

What Would You Use - Cup, Pint, Quart, or Gallon?

1 cup

1 pint

1 quart

1 gallon

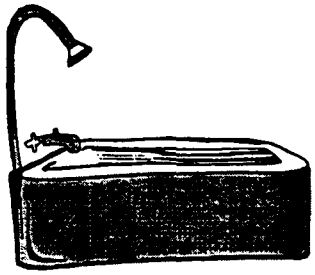
A. **Which would be best to measure the following objects?**

1.

quart

pint

2.



pint

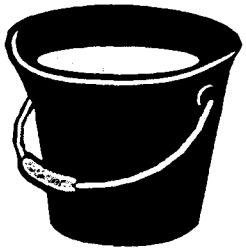
gallon

3.

pint

gallon

4.

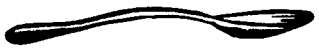


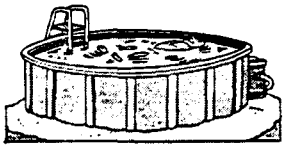
cup

quart

B. **Circle the item that holds <u>less than</u> a CUP.**

1.

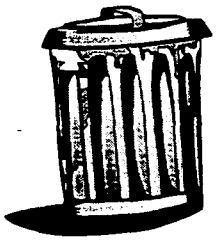




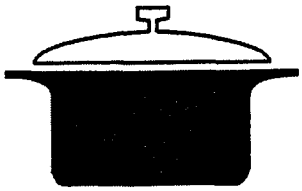
What Would You Use - Cup, Pint, Quart, or Gallon? (continued)

2. Circle the item that holds <u>about</u> a PINT.

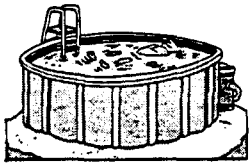
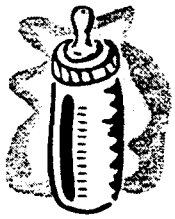




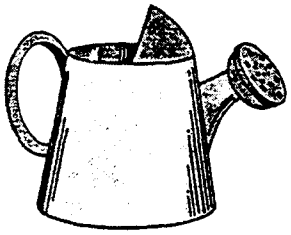
3. Circle the item that holds <u>about</u> a QUART.




4. Circle the item that holds <u>more than</u> a GALLON.

C. Circle the <u>best</u> measure for the item pictured.

1. 

1 c
1 pt
1 gal

2. 

4 c
4 qt
4 gal

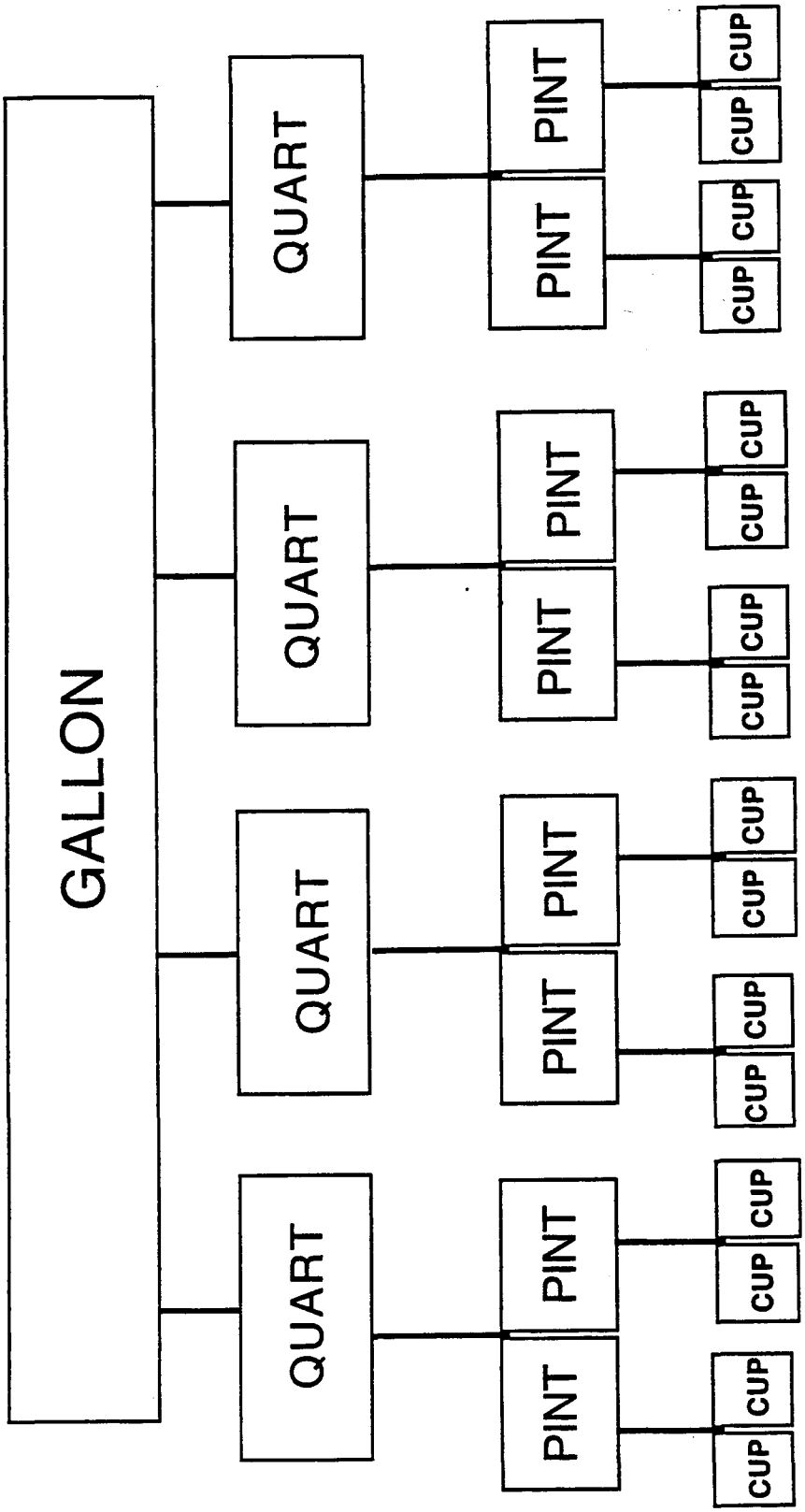
3. 

1 c
1 qt
1 gal

4. 

10 c
10 gal
10 pt

Equivalency Graphic



Conversion Chart

Larger to Smaller

Gallons to Quarts	
Quarts to Pints	
Pints to Cups	

Smaller to Larger

Cups to Pints	
Pints to Quarts	
Quarts to Gallons	

Tables of Measurement for Capacity

CUSTOMARY

1 gallon (gal)	=	4 quarts *or* 8 pints *or* 16 cups
1 quart (qt)	=	2 pints *or* 4 cups
1 pint (pt)	=	2 cups

CUSTOMARY CONVERSION CHARTS

Larger to Smaller

Gallons to Quarts	x 4
Quarts to Pints	x 2
Pints to Cups	x 2

Smaller to Larger

Cups to Pints	÷ 2
Pints to Quarts	÷ 2
Quarts to Gallons	÷ 4

METRIC

1 liter (L)	=	1,000 milliliters (mL)

Name _____

CAPACITY CHALLENGE

cup

pint

quart

gallon

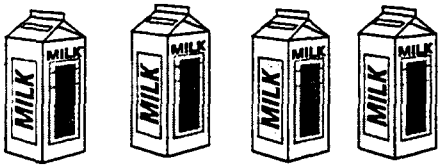
Part A

Fill in the blanks.
Example:

= ? quarts

1 gallon = 4 quarts

1.



= ? pints

_____ = _____

2.

= ? cups

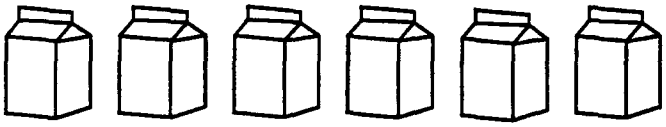
_____ = _____

3.

= ? pint

_____ = _____

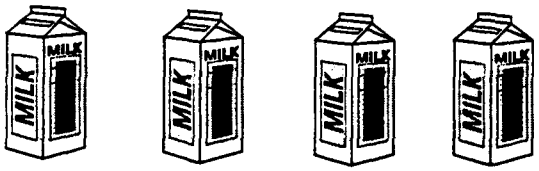
4.



= ? quarts

_____ = _____

5.



= ? pints

_____ = _____

Part B. Fill in the blanks.

1.	1 quart	=	_____ pints	7.	3 quarts	=	_____ pints
2.	2 gallons	=	_____ quarts	8.	8 pints	=	_____ quarts
3.	4 pints	=	_____ quarts	9.	8 quarts	=	_____ gallons
4.	1 pint	=	_____ cups	10.	4 quarts	=	_____ pints
5.	4 quarts	=	_____ gallon	11.	3 pints	=	_____ cups
6.	4 cups	=	_____ pints	12.	10 cups	=	_____ pints

Name _____

CAPACITY - CUSTOMARY UNITS PRACTICE

Choose the best unit of measure.
Write ***gal, qt, pt*** or ***c.***

1.  _____

2. 

_____

3. 

_____

4. 

_____

Complete the following.

5) 3 gallons = ____ quarts

6) 14 cups = ____ pints

7) 6 pints = ____ quarts

8) 6 pints = ____ cups

9) 16 quarts = ____ gallons

10) 6 quarts = ____ pints

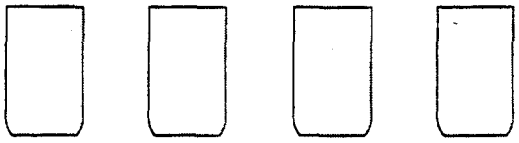
11) Miguel brings a **3-gallon** jug of water to share at the soccer game. If each person drinks **1 quart** of water, **how many people** can drink from the jug of water?

Name: _____

What Would You Use - Milliliter or Liter?

1 liter (L)

=

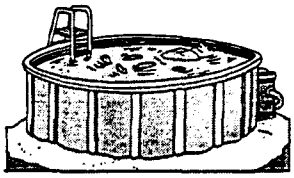


4 glasses of water

= 1,000 milliliters (mL)

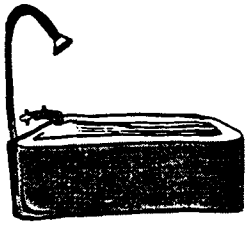
1 milliliter = 

A. Circle the item that holds <u>more than</u> a LITER.

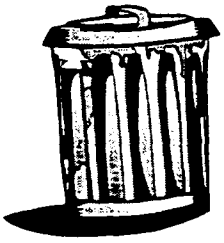
1.   

Circle the items that hold <u>less than</u> a LITER.

2. 

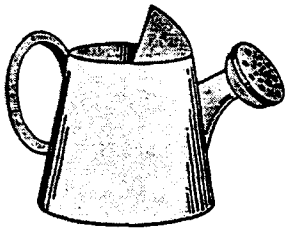
Circle the item that holds <u>about</u> a LITER.

3.   

What Would You Use - Milliliter or Liter? (Continued)

Circle the item that holds <u>about</u> a MILLILITER.

4.



B. Circle the best measure for the following items pictured.

1.

2 L

2 mL

2.

400 L

400 mL

3.

30 L

30 mL

4.

200 L

200 mL

5.

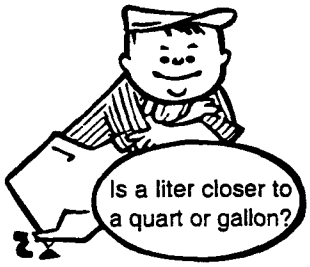
1 L

1 mL

6.

2 L

2 mL



Name _____

CAPACITY - METRIC UNITS PRACTICE

1 liter (L)

1 milliliter (mL)

Choose the best unit of measurement. Write **L** or **mL.**

1.  water in a pail _____

2.  shampoo in a bottle _____

3.  soup in a bowl _____

4.  paint in a can _____

5.  water in pool _____

Circle the most reasonable measurement.

6. a tank of gas in a car A. 60 mL B. 30 L C. 180 L

7. milk in a drinking glass  A. 25 mL B. 100 mL C. 250 mL

8. water in a straw  A. 5 mL B. 500 mL C. 750 mL

9. water in a fish aquarium A. 750 mL B. 7 L C. 40 L

10. The soccer team is having a car wash. It takes **80 liters** of water to wash **1** car. How many **liters** of water does it take to wash **5** cars?

11. Michael filled a bowl with **5** glasses of water. If each glass had a capacity of **300 mL, how many milliliters** of water did the bowl hold?

Name _____

PROBLEM SOLVING - CAPACITY

Solve the problems. Use Tables of Measurement for Capacity if you need help. Be sure to **label** your answer.

1. Mr. Lopez used **4 gallons** of paint. How many **quarts** of paint did he use?

2. Mrs. Johnson sold **18 pints** of milk yesterday. How many **quarts** of milk did he sell?

3. How many **pint** glasses could be filled from **8 quarts** of lemonade?

4. A red pitcher holds **800 mL**. A blue pitcher holds **4 L**. Which pitcher holds more?

5. A black bucket holds about **2 L** of water. A green bucket holds about **2,500 mL** of water. Which bucket holds more water?

*6. Mike and Cho have made punch for the picnic. They use a **cup** to fill a **gallon** jug. Mike pours **8 cups** and Cho pours **4 cups**. How many **cups are left** to pour?

Name: _____

The Language of Capacity

Circle TRUE or FALSE

1) A gallon holds more than a quart. True False
2) A gallon holds more than 5 quarts. True False
3) Three pints is the same as a quart. True False

Complete each sentence. Writemore or less.

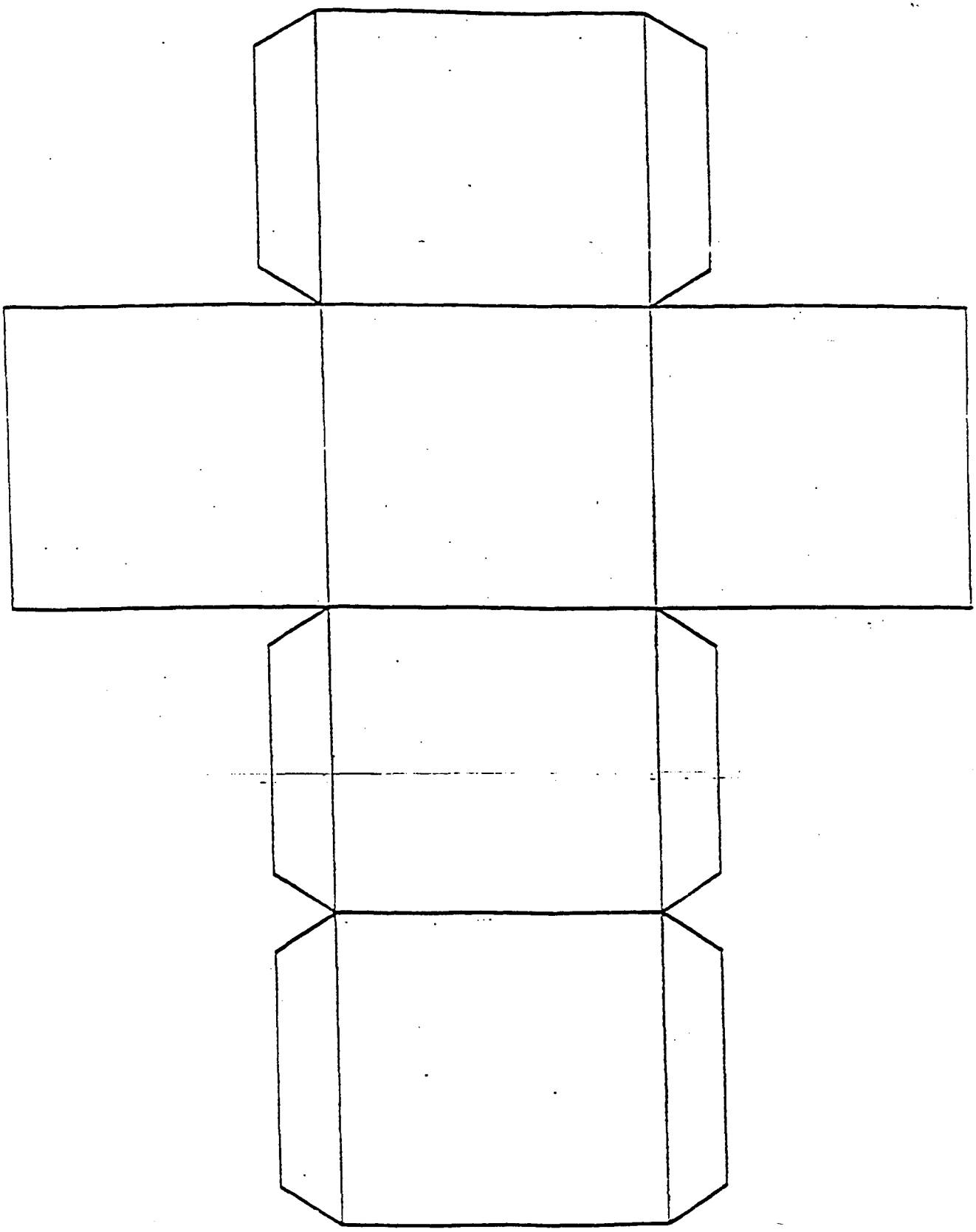
1) Water in a fish bowl is _____ than 1 milliliter. 
2) A glass of milk is _____ than 1 milliliter. 
3) A drop of rain is _____ than 1 milliliter. 
4) Water in a lake is _____ than 1 liter. 
5) The water in a dog's bowl is _____ than 1 liter. 

Write the word for each abbreviation.

1) gal _____
2) mL _____
3) qt _____
4) pt _____
5) L _____
6) c _____

Complete each sentence. Write c, pt, qt, or gal.

1) The soup bowl holds about 1 _____ 
2) Dad made about 5 _____ of sauce in the big pot. 
3) The car holds about 14 _____ of gasoline. 



Answer Key
Measurement - Obj. 7

What Would You Use - Cup, Pint, Quart or Gallon?

Part A	Part B	Part C
1) pint	1) spoon	1) 1 gal
2) gallon	2) soup	2) 4 c
3) pint	3) pot	3) 1 qt
4) quart	4) pool	4) 10 gal

Capacity Challenge

Part A

1) 4 quarts = 8 pints
2) 4 pints = 8 cups
3) 2 cups = 1 pint
4) 6 pints = 3 quarts
5) 4 quarts = 8 pints

Part B

1) 2
2) 8
3) 2
4) 2
5) 1
6) 2
7) 6
8) 4
9) 2
10) 8
11) 6
12) 5

Capacity - Customary Units Practice

1) c
2) qt
3) pt or qt
4) gal
5) 12
6) 7
7) 3
8) 12
9) 4
10) 12
11) 12 people

What Would You Use - Milliliter or Liter ?

Part A	Part B
1) pool	1) 2L
2) milk carton, spoon	2) 400 mL
3) pot	3) 30 L
4) spoon	4) 200 mL
	5) 1L
	6) 2L

Capacity - Metric Units Practice

1) L
2) mL
3) mL
4) L
5) L
6) B
7) C
8) A
9) C
10) 400 liters
11) 1,500 milliliters

Problem Solving - Capacity

1) 16 quarts
2) 9 quarts
3) 16 pint glasses
4) blue pitcher
5) green bucket
6) 4 cups

The Language of Capacity

1) True
2) False
3) False

1) More
2) More
3) Less
4) More
5) Less

Write the word for each abbreviation.

1) gallon
2) milliliter
3) quart
4) pint
5) liter
6) cup

Complete each sentence. 1) c or pt 2) qt 3) gal

Objective 8: Identify the pattern of 60 seconds in a minute, 60 minutes in an hour, 24 hours in a day. Know the meaning of a.m. and p.m. Tell time using analog and digital clocks.

Vocabulary

second
minute
hour
hand
day
digital
midnight
noon
a.m.
p.m.

Materials

stopwatch
wall clock
digital clock/watch
brass fasteners
scissors

Transparencies:

- Analog Clock
- Analog Teaching Clock
- Digital Clock
- Digital Clock Practice
- 24 Hours = 1 Day

Student Copies:

- How Much Time?
- Analog Clock
- Analog Teaching Clock
- Time 1
- Time 2
- Digital Clock
- Time 3
- 24 Hours = 1 Day
- Choosing the Time

Language Foundation

1. Some students from other countries may never have used a digital clock before. Other students may have learned specific rules about a clockface i.e. the right side is minutes **past** and the left side is minutes **to**. Explain to students that time written in numerals is always minutes past the hour; but when we speak we use minutes past the hour as well as minutes to the hour.

2. Students need to be aware that there are several different ways of expressing time. Some people say **past** the hour while others may say **after** the hour. Others say **to** the hour, **before** the hour, or **til** the hour. It is not necessary that students master all of these expressions.

3. Students will most likely be familiar with the word "hand" as a body part. Remind them that many words in English have different uses even though they are written and pronounced exactly the same.

4. Many countries in the world use a 24 hour clock. For the students from these countries it may be necessary to explain that any hour between noon and midnite is called pm in the U.S. For them this will mean any hour from 1300 to 2400.

Mathematics Component

1. Identify patterns of time using seconds, minutes, hours, and days.
   - Write the word **second** on the board as you say it. Tell students that a second is a very short amount of time. (You might have to distinguish between the use of the word second as an ordinal number.) Give an example, "I can snap my finger in a second." (Some of you may be able to snap your fingers 2 times in a second.)
   - Ask students what other actions might take one second. (Answers will vary but might include 1 jump, 3 quick claps, writing of initials, etc. Accept any answer that is realistic - if students are way off on their suggestions, have them do the action and time them on a stopwatch so they see how much time the action actually takes.)
   - To give students a concept of how long 5 seconds is, have them write their first name repeatedly on a piece of paper while you time 5 seconds on a stopwatch. Repeat this experiment for 15 seconds and 30 seconds to give them an idea of the length of time.
   - Point to the clock on the wall. Tell students that the hand that is moving is the **second hand.** Every time the hand moves is 1 second. (You may have to explain the 2 meanings of the word hand.)
   - Together as a class, count the seconds as the second hand goes around the clock. (60 seconds) On the board write **60 seconds = 1 minute.**
   - Point to the word **minute** on the board as you say it. Tell students that a minute is also a short amount of time, but it is much longer than a second. (Students should already be familiar with a minute of silence so they can relate to the length of a minute.)
   - To reinforce the concept of the length of a minute, tell students to count by fives for exactly 1 minute as you time a minute on a stopwatch or the classroom clock. You may choose an alternative activity like clapping hands, writing their address repeatedly, working on a page of basic facts, making a list of words related to a specific topic, etc.
   - Show students the **minute hand** on the clock. Point to the clock as you explain how the second hand moves 60 times for every 1 move of the minute hand.
   - Show students the lines on the clock that stand for minutes. Point out that the darker lines on the clock represent 5 minutes. Together as a class count by 5 until you reach 60 as you point to the darker lines on the clock.
   - Ask students for the total number of minutes if you go around the clock 1 time. (60) You might have to refer back to the clock, the minute hand, and the marks that stand for each minute. Remind students that the class counted by five to determine the number of minutes in one complete circle of the clock.
   - Write **hour** on the board. Tell students that there are 60 minutes in 1 hour as you write **60 minutes = 1 hour** on the board. Tell students that an hour is a long amount of time. Give some examples, "This class is almost 1 hour long. You can watch 2 TV shows in 1 hour."

- Show students the **hour hand** on the clock. Point to the clock as you explain that the minute hand has to move 60 times for the hour hand to move just once.
- Tell students that the numbers on the clock represent 1 hour. The hour hand points to the number that tells you what hour it is.
- Write the word **day** on the board as you say it. Tell students that a day is a very long period of time. Give some examples, "In 1 day, we sleep, eat breakfast, lunch and dinner, go to school, play soccer, do homework and watch TV," and "Every time you wake up, it is a new day."
- Tell students there are 24 hours in a day as you write **24 hours = 1 day** on the board.
- Have students refer to the information about units of time on the board as they answer the following questions:
    1. Which unit of time is the shortest? (second)
    2. Which unit of time is the longest? (day)
    3. Which is longer - a minute or an hour? (hour)
    4. Would it take you 20 minutes or 20 seconds to eat lunch? (20 minutes)
    5. Would it take you 2 hours or 2 minutes to brush your teeth? (2 minutes)
    6. Would it take more or less than 1 minute to do your math homework? (more)
    7. Would it take you more or less than 1 hour to read a 300 page book? (more)

  Ask additional questions of the same type if students don't indicate understanding.

- Distribute How Much Time? Read together the units of time chart and the explanations at the top of the page. Together decide on examples of activities that take 1 second, 1 minute, and 1 hour. Write each example in the appropriate box. Have students form pairs and come up with more activities that take 1 second, 1 minute, and 1 hour. Have them write the activities in the boxes on the activity sheet. When activity sheet is completed, have students share answers with the class.

2. Tell time using an analog clock.
    - Give each student a copy of Analog Clock. Display a transparency copy on the overhead.
    - Point out the 3 different hands on the clock. Ask students the name of the hand that moves the fastest. This hand counts the smallest unit of time. (second hand) Have a student point out the second hand on the transparency. Tell student that the second hand is the hand that is always moving. Write **second hand** on the transparency as students write it on their activity page.
    - Ask students the name of the hand that tells the minutes. (minute hand) Have a student point out the minute hand on the transparency. Tell students to note that the minute hand is the longer hand. Write **minute hand** on the transparency as students write it on their activity page.
    - Ask students the name of the shortest hand on the clock. This hand moves the slowest. (hour hand) Have a student point out the hour hand on the transparency. Write **hour hand** on the transparency as students write it on their activity page.
    - Review the name and purpose of the hands on the clock as you go over the information in the box

in the middle of Analog Clock .

- Direct students' attention to the bottom of the transparency. Point out the correct way to write time and to say it. Have students practice saying 3 o'clock out loud. Tell students to use the information on Analog Clock as the lesson continues.
- Distribute Analog Teaching Clock and a brass fastener to each student. Direct students to cut out the clock face and the arrows. Have them secure the arrows to the clock using a brass fastener. Make an Analog Teaching Clock transparency or have a commercially-made overhead clock to use for demonstration.
- Have students set their clocks to read 3:00. (Students may refer to Analog Clock if necessary) Set the overhead clock to 3:00. Point out the hour hand is on the 3 and the minute hand is on the 12. Tell students that whenever the minute hand points to the 12, the time is exactly the hour.
- Have students practice time to the hour by having them set their clocks to specific times (4:00, 8:00, 11:00, etc.). Check to make sure the hour hand is on the correct number and the minute hand points to the 12. Have students practice the language by reading the times out loud after displaying the times on their clocks.

- Make sure the overhead clock is set to 3:00. Have students watch as you move the minute hand to the 1, the 2, and stop at the 3, counting by fives as the minute hand moves. Write 3:15 on the overhead and tell students the time is now three fifteen. (You might have to review with students that the dash marks on the clock face stand for 1 minute and every number represents 5 minutes. If students have difficulty remembering that every number stands for 5 minutes, have them write 5 by the 1, 10 by the 2, 15 by the 3, etc.)
- Divide the overhead clock into fourths to illustrate that 15 minutes is one quarter of an hour. Tell students that 3:15 is sometimes read as quarter past three or quarter after 3.
- Continue counting by fives as you move the minute hand from 3:15 to 3:30. Write 3:30 on the overhead and tell students the time is now three thirty. Tell students that since 30 minutes is one-half of 60, then 3:30 is sometimes read as half past three.
- Count by fives as you move the minute hand from 3:30 to 3:45. Write 3:45 on the overhead and tell students that the time is now three forty-five. Tell students that 3:45 is sometimes read as quarter to four or 15 minutes to 4. Explain that as you get closer to the next hour (more than halfway - 30 minutes- past the hour) the time is often referred to as the minutes before the next hour. Show students how the hour hand moves very slowly as the minutes go by. When it is 30 minutes past 3, the hour hand is halfway between 3 and 4. As the minute hand moves toward the 4, the hour hand slowly does the same. This concept might be difficult for some students and will have to modeled and reviewed many times.
- Have students practice telling time by the quarter hour by having them set their clocks to specific times (5:15, 6:30, 9:45, etc.). Have students practice the language by reading the times out loud after displaying the times on their clocks.

- Ask students how many minutes are represented by each number on the clock. (5) Set the overhead clock at 11:10. Ask students to tell the time. If necessary, remind them to read the hour first and then the minutes.
- Do a few more examples on the overhead clock. (7:25, 4:35, 2:50, etc.) Make sure students are reading the hour first and then the minutes.
- Have students practice telling time by 5 minute intervals by having them set their clocks to specific times (3:40, 10:05, 5:55, etc.). Have students practice the language by reading the times out loud after displaying the times on their clocks. (Some students will use language such as 20 minutes until 3; other students will only be able to express time as minutes after an hour. Accept either way.)

- Using the overhead clock, have a student point out the minute markings on the clock face. Ask students the number of minutes in 1 hour. (60)
- Set the overhead clock at 6:27. Ask students to tell the time. Remind them to count by fives to 25 (the 5 on the clock face) and then add the 2 minutes to get a total of 27.
- Do a few more examples on the overhead clock. (3:08, 9:41, 12:34, etc.)
- Have students practice telling time by one minute intervals by having them set their clocks to specific times (4:39, 2:11, 1: 22, etc.). Have students practice the language by reading the times out loud after displaying the times on their clocks.
- Distribute Time 1 and Time 2. Go over the directions and examples with students. Have students complete the activity pages.

4. Tell time using a digital clock.
   - If possible have an example of a digital clock or a digital watch in the classroom to show students. Tell students this clock is called a **digital** clock. (You might want to point out the connection between the word digital and the digits that are on the clock.)
   - Ask students what the differences are between a digital clock and an analog clock. (Possible answers include digital clock displays exact time, analog clock displays number 1-12 and time has to be determined by placement of minute and hour hands.)
   - Give each student a copy of Digital Clock and display a transparency copy on the overhead.
   - Go over the transparency with students.
   - Display transparency Digital Clock Practice. Use the blank digital clocks to write examples and have students read the time displayed. Transparency may be erased and more examples written if more practice is needed.
   - Distribute Time 3. Go over directions with students. Have them complete the activity sheet.

5. Distinguish between a.m. and p.m.
   - Direct students' attention to the classroom clock. Ask them how many hours are on the clock. (12) You might have to remind them that the numbers on the clock represent the hours.
   - Ask students how many hours are in 1 day? (24) Students might need to refer to the information at the top of How Much Time?
   - Tell students that since there are 24 hours in 1 day and only 12 hours on the clock, the hour hand on the clock must make 2 complete circles every day. That means every day there are two 1 o'clocks, two 2 o'clocks, etc.
   - Distribute 24 Hours = 1 Day to each student. Display a transparency of the activity sheet on the overhead.
   - Tell students that each day begins at 12:00 a.m. which is commonly called **midnight** and ends the following midnight. Point out to students the two 12:00s, two 1:00s, etc.
   - Have students speculate how the difference between the two 12:00s, the two 1:00s, etc. can be found. (Allow students to speculate; some students might notice the a.m. and the p.m. on the activity sheet and say those letters indicate the difference.)
   - Tell students that in the morning (from 12:00 midnight until 11:59 in the morning) **a.m.** is used, and in the afternoon/evening hours (from 12:00 **noon** until 11:59 in the night) **p.m.** is used. Have students write morning in the margin of the activity sheet by the a.m. times and afternoon/evening in the margin of the activity sheet by the p.m. times as you do the same on the transparency.
   - Ask students the time of the math class to the nearest hour. Ask students if math class is in the a.m. or the p.m. On the transparency, write math class in the blank next to the appropriate time. Have students write in math class on their activity sheets.
   - Ask students the activity they are normally doing at midnight. (sleeping) Write sleeping on the transparency next to midnight and have the students do the same on their activity sheets.
   - Direct students to complete the chart with activities they normally do at that time of the day. When activity sheet is complete, have students share some of the activities they do in the morning (a.m.) and in the afternoon/evening. (p.m.)
   - Distribute Choosing the Time. Go over directions with students. Have students complete the activity sheets independently.

Name _____

How Much Time?

A **second** is a **very short** amount of time

A ***minute*** is a **short** amount of time

Units of Time

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day

A **hour** is a **long** amount of time

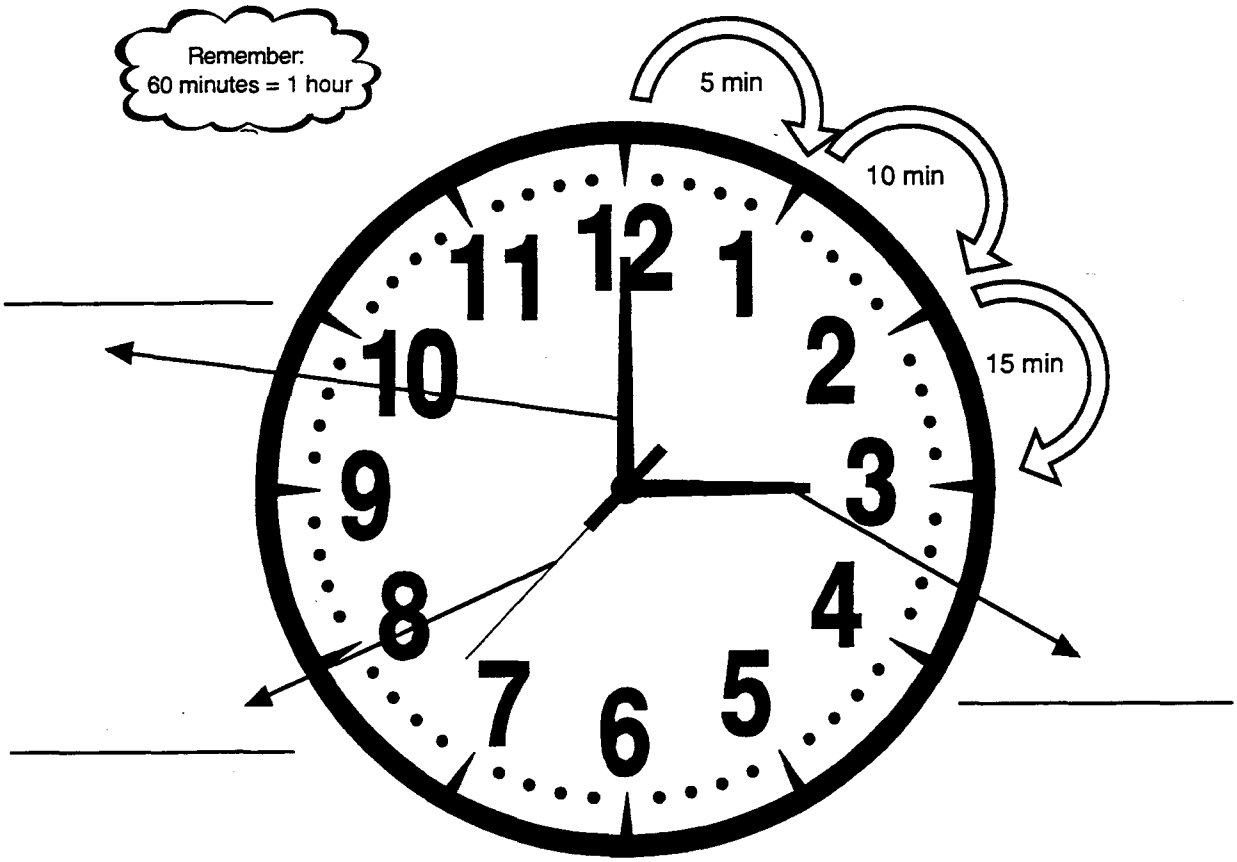
1 Second

1 Minute

1 Hour

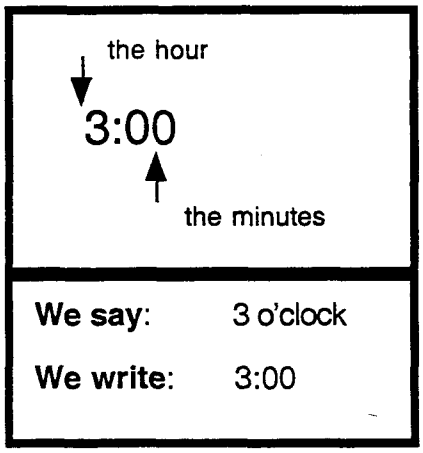
Name _____ Transparency/Student Copy

Analog Clock



Hour hand - tells the hour (the short hand)
Minute hand - tells the minutes (the long hand)
Second hand - tells the seconds (the continually moving hand)

What **time** is it?

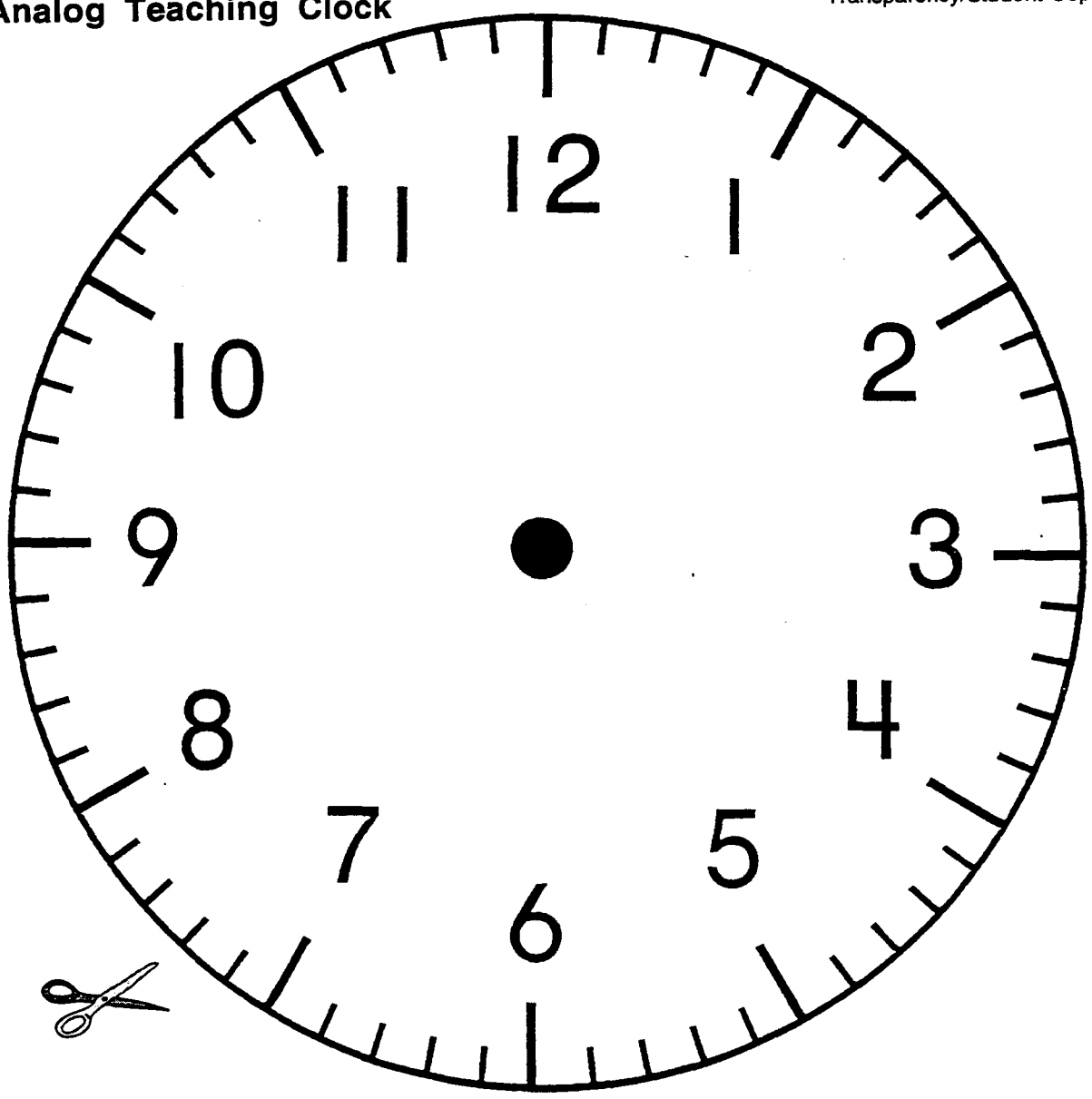


We say: 3 o'clock

We write: 3:00

Analog Teaching Clock

Transparency/Student Copy



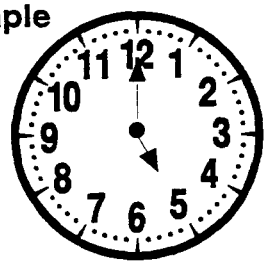
Name _____

Time 1

Remember: The little hand tells the hour and the big hand tells the minutes.

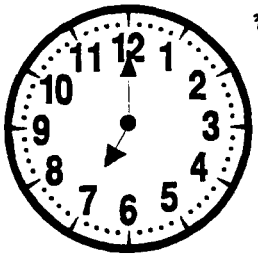
Write the time shown on the clock.

Example



5:00

1.



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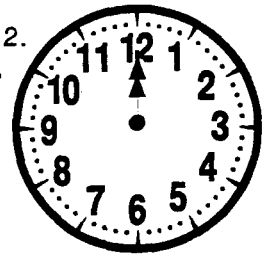

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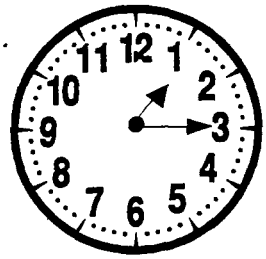
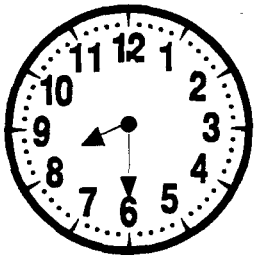
3.



_____

4.



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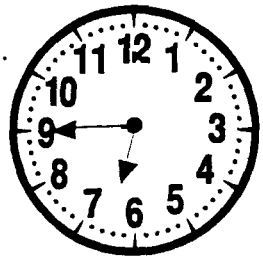
5.



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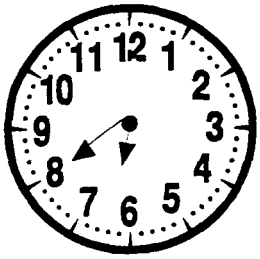
6.



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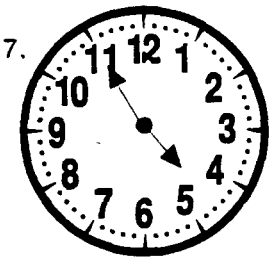
7.



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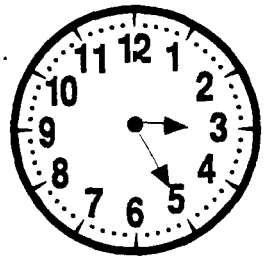
8.



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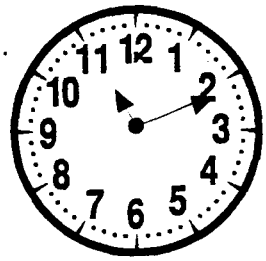
9.



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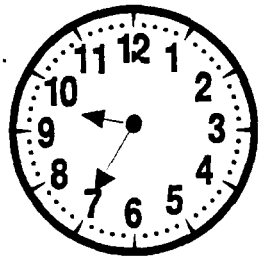

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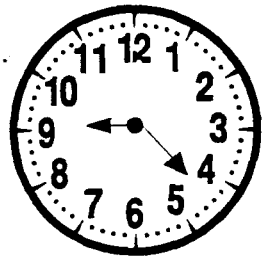
11.



_____

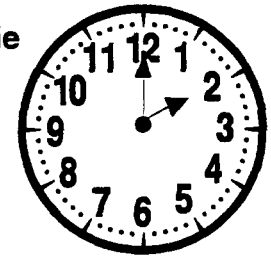
Name _____

Time 2

Remember: The little hand tells the hour and the big hand tells the minutes.

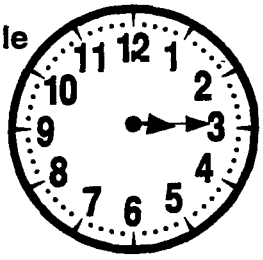
Draw the hands.

Example



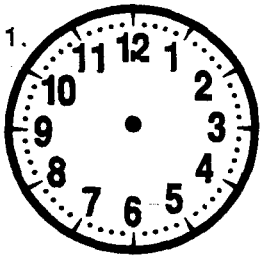
2:00

Example



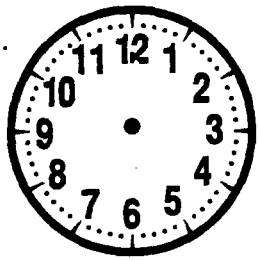
3:15

1.



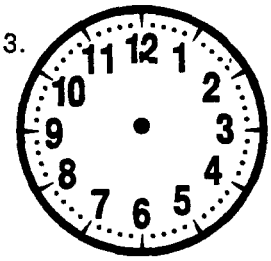
10:00

2.



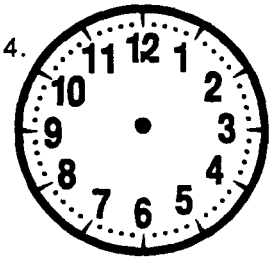
6:00

3.



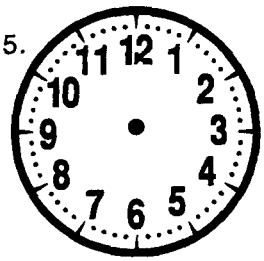
11:45

4.



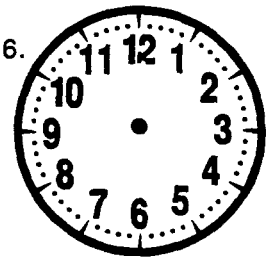
5:15

5.



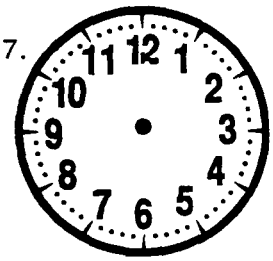
12:00

6.



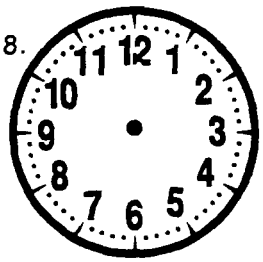
1:55

7.



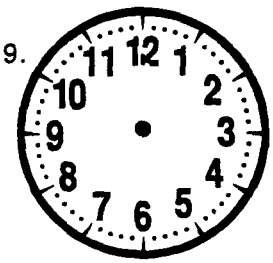
8:30

8.



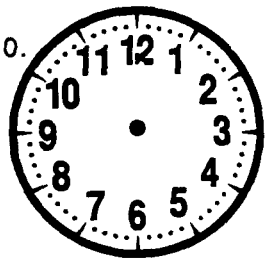
5:06

9.



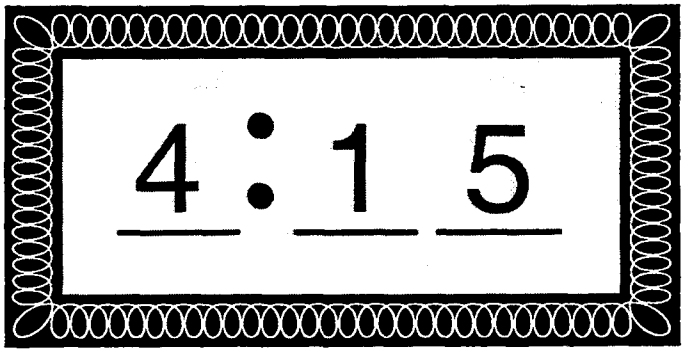
6:42

10.

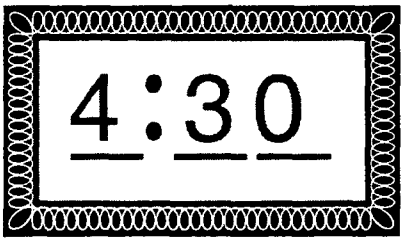


3:14

Digital Clock

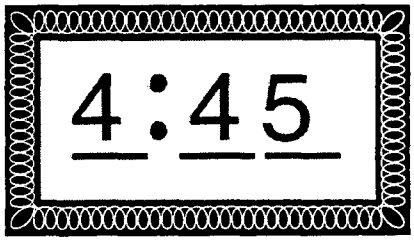


We say: four fifteen
quarter past four
fifteen minutes after four



We say:

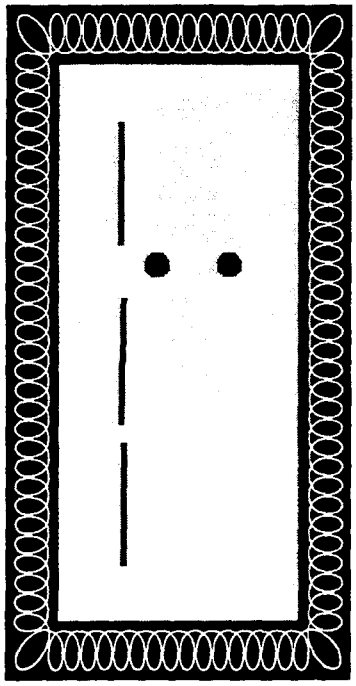
four thirty
half past four
thirty minutes after four

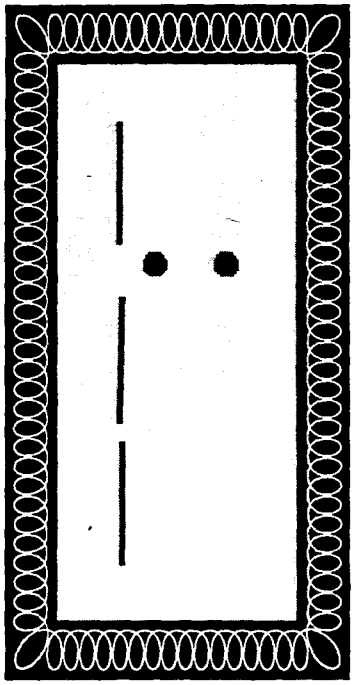


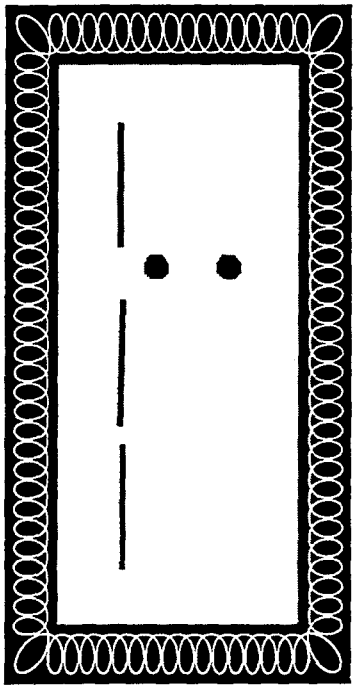
We say:

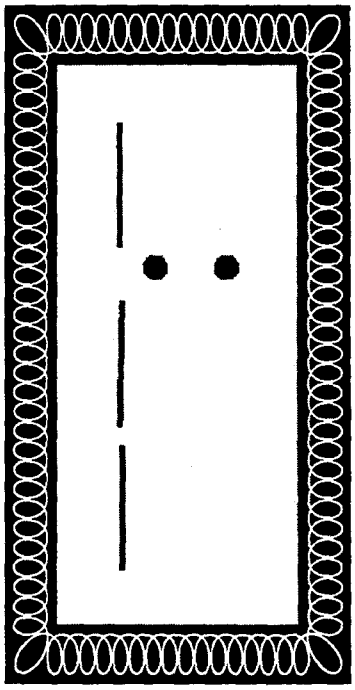
four fourty-five
quarter to five
fifteen minutes to five

Digital Clock Practice





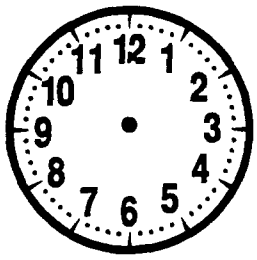




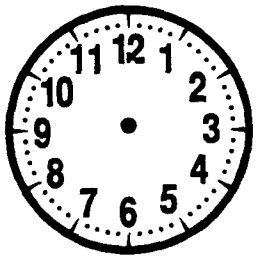
Name _____

Time 3

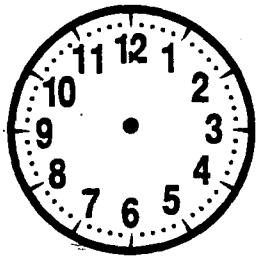
A. Draw the hands on the analog clock to match the time on the digital clock.

1. 

2: 45

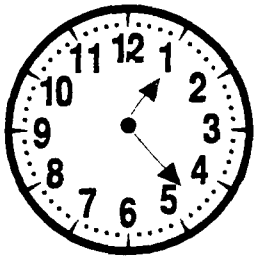
2. 

4: 30

3. 

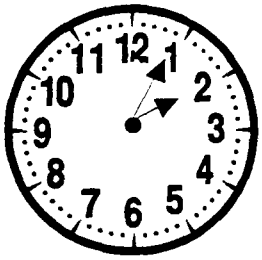
1: 15

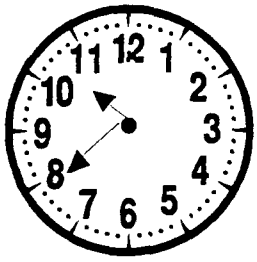
B. Draw lines to match the analog clock with the digital clock.



10: 40

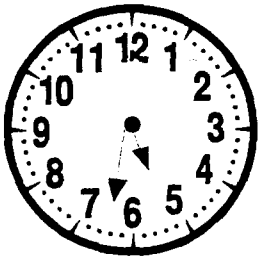
5: 32





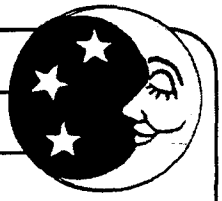
1: 23

2: 05



Name _____

24 Hours = 1 Day



12:00 a.m. (midnight)_____

1:00 a.m._____

2:00 a.m._____

3:00 a.m._____

4:00 a.m._____

5:00 a.m._____

6:00 a.m._____

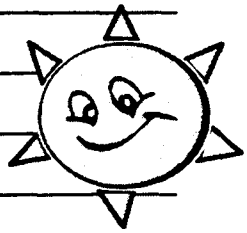
7:00 a.m._____

8:00 a.m._____

9:00 a.m._____

10:00 a.m._____

11:00 a.m._____



12:00 p.m. (noon)_____

1:00 p.m._____

2:00 p.m._____

3:00 p.m._____

4:00 p.m._____

5:00 p.m._____

6:00 p.m._____

7:00 p.m._____

8:00 p.m._____

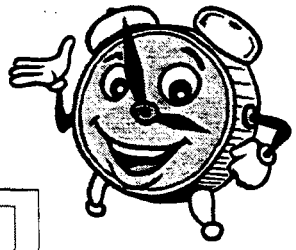
9:00 p.m._____

10:00 p.m._____

11:00 p.m._____

Name _____

Choosing the Time

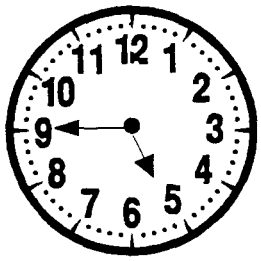


a.m. - the time between midnight and noon
(sleeping, breakfast, school starts)

p.m. - the time between noon and midnight
(school's out, dinner, bedtime)

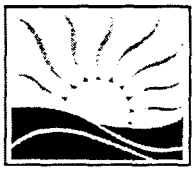
Write the time by using **numbers** and **a.m.** or **p.m.**

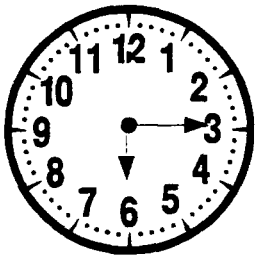
1. Miguel eats dinner.



_____

2. The sun rises.





_____

3. Paolo eats lunch at school.

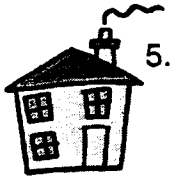
11 : 40

_____

4. Angela walks to school.

7 : 20

_____



5. The time you get home from school.

_____

6. The time the mall closes.

_____

7. The time school starts.

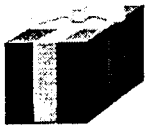
_____

8. The time your favorite TV show begins.

_____

Read the story below and answer the questions.

On Thursday morning, Maria bought a birthday gift at the mall. At 12:15 p.m. she bought some flowers at the mall flower shop. Maria left the birthday gift at Juanita's house at 2:00 p.m. The mall opened at 9:00 a.m.



1. Did Maria buy the birthday gift before going to the flower shop? _____

2. Did Maria buy the flowers before going to Juanita's house? _____

3. Did Maria arrive at Juanita's house before or after 12:15 p.m.? _____

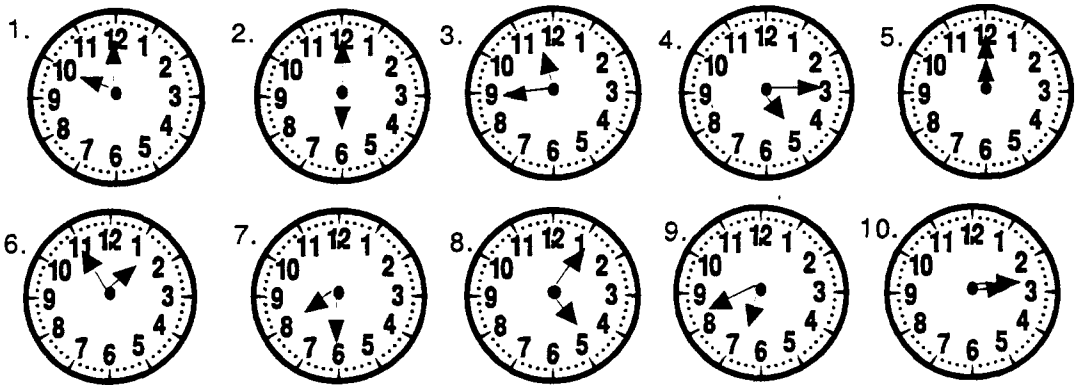
4. Did Maria buy the birthday gift before or after 9:00 a.m.? _____

Answer Key
Measurement - Obj. 8

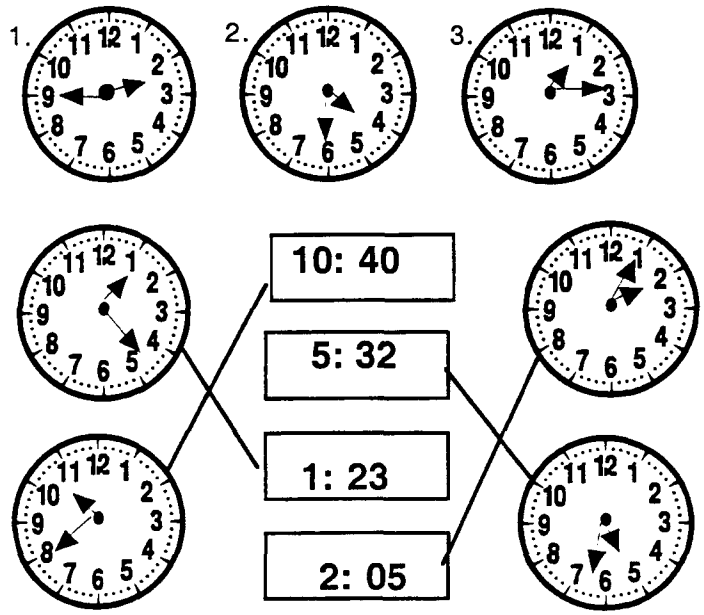
Time 1

1. 7:00	2. 12:00	3. 1:15	4. 8:30
5. 6:45	6. 6:40	7. 4:55	8. 3:25
9. 11:11 or 11:12	10. 9:35	11. 9:22 or 9:23	

Time 2



Time 3



Choosing the Time

1. 5:45 p.m. 2. 6:15 a.m. 3. 11:40 a.m. 4. 7:20 a.m.

5. - 8. Accept any reasonable answer

1. yes 2. yes 3. after 4. after

Objective 9: Convert units of time. Find the elapsed time in hours and minutes between two given times.

Vocabulary

There is no new vocabulary in this lesson.

Materials

overhead analog clock
analog clocks

Transparencies:

Regrouping Time

Student Copies:

Converting Units of Time
How Much Time Has Passed?
What Will the Time Be?
Passing Time
Find the Time

Language Foundation

1. Time passed is an expression that students may not be familiar with. The expression translates directly in Spanish as " *tiempo pasado.*" You may need to explain to students that time passed is the same as time that is gone or used up. i.e. "Two hours passed while I was at the mall." Passing time means using up time. i.e. "I'm passing my time reading a book."

Mathematics Component

Note: Avoid using calculators when doing division in this lesson as remainders will be shown as decimals and will cause confusion for students. If students have difficulty with the division, pair them up with another student who is stronger in division or let them use a multiplication fact chart.

1. Convert units of time - minutes to hours and hours to minutes.
   - Review units of time. Ask students how many seconds are in 1 minute. (60) Write **60 seconds = 1 minute** on the board.
   - Ask students how many minutes are in 1 hour. (60) Write **60 minutes = 1 hour** on the board.
   - Ask students how many hours are in 1 day. (24) Write **24 hours = 1 day** on the board.
   - Say to students, "There are 60 minutes in 1 hour. How many hours are in 120 minutes?" Write **120 minutes = ___ hours** on the board.
   - Display an overhead analog clock (either the transparency Analog Clock from Obj. 8 or a commercially-made overhead clock) that is set at 12:00. Count by fives as you move the minute hand around the clock. When you get to 60 minutes, stop and ask students how many hours are in 60 minutes. (1) Write 1 hour on the board.
   - Continue to count by fives (begin at 60) as you move the minute hand around the clock again. Stop counting when you reach 120. Ask students if the minute hand made another complete circle around the clock. (Yes, because the minute hand started at 12 and ended at 12.) Ask students how many times the minute hand went around in a complete circle. (2)
   - Tell students that each complete circle of the minute hand around the clock makes 1 hour. It takes 2 complete circles or 2 hours to reach 120 minutes. Therefore, 120 minutes = 2 hours. Write **2** in the answer space in the problem.
   - Ask students if there is another way to find how many hours are in 120 minutes without using the clock. Allow students time to speculate. You might have to give them hints like pointing to 60 minutes = 1 hour and asking which operation would be used to get from 120 to 2.
   - Write on the board 120 ÷ 60 = 2. (If students have difficulty remembering how to divide mentally, refer to Obj. 13, Operations - Multiplication and Division, for a review.) Tell students that 120 minutes are divided by 60 minutes (the number of minutes in 1 hour) to find the number of hours.
   - Do some examples with students. (360 minutes = ___hours, 480 minutes = ___ hours, 1,200 minutes = ___ hours, etc.) Make sure students understand that division is used since we are moving from smaller units (minutes) to larger units (hours).
   - Write **90 minutes = ___hours** on the board. Ask students how to solve this problem. (Divide 90 by 60.) Do the computation on the board.

$$\begin{array}{r} 1 \text{ R } 30 \\ 60\overline{)\,90} \\ -\,60 \\ \hline 30 \end{array}$$

- Ask students what the 1 represents. (1 hour) Ask students what the remainder (30) represents. (30 minutes.)
- Tell students that sometimes the minutes are not evenly divisible by 60 so there is a remainder. That remainder is the number of minutes left over after the complete hours are taken out of the original number of minutes. The answer would be written as 1 hour 30 minutes.
- Do some other examples with students. (150 minutes = ___hours ___ minutes, 190 minutes = ___ hours ___ minutes, 210 minutes = ___ hours ___ minutes, etc.)

- Write **6 hours = ___ minutes** on the board. Ask students the difference between this problem and the previous problems as you point to the problems. (Previous problems gave the number of minutes and asked for the number of hours; this problem gives number of hours and asks for number of minutes.)
- Tell students that since this problem asks for the opposite information (number of minutes instead of number of hours) the opposite operation is used. Ask students the opposite operation of division. (multiplication)
- Tell students that to go from hours to minutes (larger units to smaller units) multiplication is used since there will be more minutes (the smaller units) than hours (larger units).
- Ask students how many minutes are in 1 hour. (60) Tell students since there are 60 minutes in one hour, the number of hours (6) must be multiplied by the number of minutes in 1 hour (60) in order to find out how many minutes are in 6 hours.
- Write 60 x 6 on board. Ask students to find the product. (360) Write **360** in the answer blank on the board.
- Do some examples with students. (5 hours = ___ minutes, 7 hours = ___ minutes, 4 hours =___ minutes, etc.) Make sure students understand that multiplication is used to go from hours (the larger units) to minutes (the smaller units).
- Write **2 hours 14 minutes = ___ minutes** on the board. Ask students how to solve the problem. (Multiply 2 x 60) Ask them what happens to the 14 minutes. (Since the 14 is already minutes, it needs to be added to the product of 2 x 60.) Do the computation with students.

$$2 \times 60 = 120 + 14 = 134 \text{ minutes}$$

- Do some other examples with students. (3 hours 5 minutes = ___ minutes, 5 hours 25 minutes = ___ minutes, 6 hours 12 minutes =___ minutes, etc.)

2. Convert units of time - hours to days and days to hours.
   - Write **48 hours =___ days** on the board. Ask students how many hours are in a day. (24)
   - Tell students that 48 hours (the smaller unit) needs to be changed to days. (the larger unit) Ask students what operation would be used. (division) Tell students that 48 hours is divided by 24 hours (the number of hours in 1 day) to find the number of days. 48 ÷ 24 = 2. Write **2** in the answer blank on the board.

- Tell students that to go from hours to days, the number of hours is divided by 24. Do some examples with students. (36 hours = ___ days, 48 hours = ___ days, 72 hours = ___ days, 40 hours = ___ days___ hours, 52 hours = ___ days ___ hours.) Make sure students understand what to do with remainders.

- Write **6 days = ____ hours** on the board. Tell students that 6 days (the larger unit) needs to be changed to hours (the smaller unit). Ask students what operation is used. (multiplication) Ask students what number to multiply 6 by to get the number of hours in 6 days. (24) Do the computation on the board and record the answer in the original problem.

$$\begin{array}{r} 24 \\ \times\ 6 \\ \hline 144 \end{array}$$

- Do some more examples with students. (8 days = ___ hours, 7 days = ___ hours, 2 days 5 hours = ___ hours, 3 days 11 hours = ___ hours)
- Assign Converting Units of Time. Go over directions with students. Note that some conversions are seconds to minutes and minutes to seconds which were not specifically taught in this lesson. With the information given at the top of the page, students should be able to do these conversions with minimal guidance. Have students complete the activity pages.

3. Determine time elapsed in hours and minutes without regrouping of hours to minutes.
   - Set the overhead analog clock to read 1:00. Say to students, "It is 1:00 p.m. now. I eat dinner at 6 p.m. How many hours until I eat dinner?"
   - Move the hands on the overhead clock as you count the hours from 1 to 6. Ask students how many hours until you eat dinner. (5)
   - Ask students if there is a way to solve this problem using just numbers and not the clock. Let students speculate. Write 6:00 p.m. - 1:00 p.m. = 5 hours vertically on the board. Point out to students that 5 is the same answer that was obtained moving the hands of the clock.
   - Do some more examples like the one above. (i.e. "I leave for school at 7 a.m. and I teach math at 10:00 a.m. How much time passes between the time I leave for school and the time I teach math?") Have student volunteers move the hands on the overhead clock as the class counts out loud. Write the problems (10:00 a.m. - 7:00 a.m. = 3 hours) vertically on the board. Make sure the examples do not cross over 12:00.

   - Set the overhead clock to 2:15. Say to students, "It is 2:15 p.m. I get home from school at 4:30 p.m. How many hours until I get home from school?"
   - Ask students what question needs to be answered. (How many hours is it from 2:15 until 4:30?)
   - Tell students that the clock will start at 2:15 and end at 4:30 as the time is counted. Move the hour hand 1 turn so the clock reads 3:15. Tell students 1 hour has passed. Move the hour hand

another hour so the clock reads 4:15. Tell students 2 hours have passed.

- Ask students if the clock hand needs to be moved another hour. (No, the clock needs to only go to 4:30.) Remind students that 2 hours have already passed as you count "2 hours 5 minutes, 2 hours 10 minutes, 2 hours 15 minutes" as you move the minute hand from 4:15 to 4:30. Tell students that it is 2 hours and 15 minutes from 2:15 p.m. until 4:30 p.m.
- Restate the problem and repeat the above procedure, counting from 2:15 until 4:30 on the overhead clock.
- Tell students that to solve this problem without using a clock, subtraction would be used. Write the problem on the board and solve it with the students. Point out the same answer is found by using the clock and by doing the subtraction.

$$\begin{array}{r} 4 \text{ hours } 30 \text{ minutes} \\ -\ 2 \text{ hours } 15 \text{ minutes} \\ \hline 2 \text{ hours } 15 \text{ minutes} \end{array}$$

- Do some more examples like the one above. (i.e. "It is 8:20 a.m. I have a meeting with the principal at 10:40 a.m. How much time will pass until I meet with the principal?") Have a student move the hands on the overhead clock as the class counts out loud. Write the problems (10 hours 40 minutes - 8 hours 20 minutes = 2 hours 20 minutes) on the board. Make sure the examples do not cross over 12:00.
- Distribute How Much Time Has Passed? Go over example with students. Have students complete activity page. If students have difficulty doing the computation, let them manipulate an analog clock to find the elapsed time. (See Objective 8 Measurement for a pattern for an analog clock.)

4. Determine current time after set amount of time has elapsed.
   - Set the overhead analog clock to 3:00. Say to students, "It is now 3:00 p.m. I will spend the next 3 hours grading math tests. What time will it be when I finish?"
   - Ask students the number of full turns the hour hand must make before you are done grading tests. (3 full turns representing the 3 hours) Have a student volunteer turn the hour hand on the overhead clock 3 times as the class counts the turns out loud.
   - Ask students the time on the overhead clock now. (6:00) Restate the original problem, asking students what time it will be when you finish grading papers. (6:00 p.m.)
   - Ask students if there is a way to solve this problem without using the clock to "add on" the time. Write the computation vertically on board. (3:00 p.m. + 3 hours = 6:00 p.m.) Point out to students that 6:00 p.m. is the same answer as when the clock was used.

- Do some more examples with students. (i.e. "It is 2 a.m. I will sleep 8 hours. What time will it be when I get up?") Have student volunteers move the hands on the overhead clock as the class counts out loud. Write the problems (2:00 a.m. + 8 hours = 10:00 a.m.) vertically on the board. Make sure the examples do not cross over 12:00.

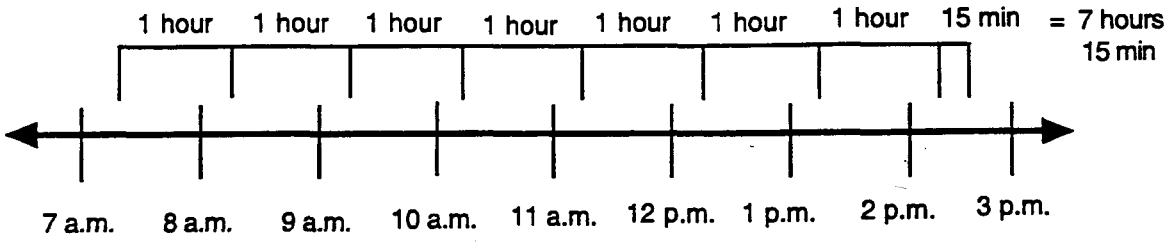
- Set the overhead clock to 5:30. Say to students, "It is 5:30 p.m. It takes me 1 hour and 10 minutes to make dinner. What time will dinner be ready?"
- Ask students what question needs to be answered. (What time will it be after an hour and 10 minutes have passed?)
- Tell students that 1 hour and 10 minutes will be added to the current time of 5:30 to find out the time dinner will be ready.
- Move the overhead clock's hands 1 complete turn. Ask students how many hours have passed. (1) Ask students how much time it takes to make dinner. (1 hour and 10 minutes) Tell students that 10 more minutes need to pass on the clock.
- Count by fives (1 hour and 5 minutes, 1 hour and 10 minutes) as you move the minute hand to the 8. Ask students what time is shown on the clock. (6:40)
- Restate the original problem and ask students what time dinner will be ready. (6:40 p.m.)
- Ask students if there is a way to solve this problem without using the clock to "add on" the time. Write the computation on the board. Point out to students that the same answer was found by using the clock and by doing the addition problem. Remind students that since the answer is a time, it should be written in the proper format. **(6:40 p.m.)**

$$\begin{array}{r} 5 \text{ hours } 30 \text{ minutes} \\ +\ 1 \text{ hour } 10 \text{ minutes} \\ \hline 6 \text{ hours } 40 \text{ minutes} \end{array} \quad \text{or } 6{:}40 \text{ p.m.}$$

- Do a few more examples with students. (i.e. "I started cleaning the house at 1:25 p.m. It took 3 hours and 25 minutes to clean the entire house. What time did I finish cleaning the house?") Have student volunteers move the hands on the overhead clock as the class counts out loud. Write the problems (1 hour 25 minutes + 3 hours 25 minutes = 4 hours 50 minutes or 4:50 p.m) on the board. Make sure the examples do not cross over 12:00 and the answers are written in the proper format.
- Distribute What Will the Time Be? Go over the example with students. Have them complete the activity page. If students have difficulty with the computation, let them use an analog clock to find the answers.

Note: If students have little difficulty with simple elapsed time, do some problems that involve crossing over 12:00. (Example - School begins at 7:15 a.m. School ends at 2:30 p.m. How long does school last?) Subtraction does not work on this problem. Have students count the time from 7:15 to 2:30 using the analog clock. Have them start at 7:15 and count by the hour (8:15, 9:15, etc.) until they reach 2:15 or 7 hours. Then have students move the minute hand on the analog clock,

counting by fives until the hand reaches 2:30 for a total of 7 hours and 15 minutes. Some students might do better with a number line as opposed to the analog clock. See example below.



- Passing Time is included for further practice with word problems and elapsed time. The second page of this activity sheet has problems that include time crossing over 12. Provide an analog clock for students to use.

5. Regroup hours to minutes and minutes to hours.
   - Set the overhead analog clock to 4:15. Say to students, "It is 4:15 p.m. now. I will eat dinner at 6:00 p.m. How much time do I have to wait before dinner?"
   - Turn the hands of the clock 1 hour to 5:15, counting out loud as you do so. Turn the hands a second whole hour to 6:15, saying 2 out loud.
   - Ask students, "What time does the clock say now? (6:15) What time did I say I was going to eat dinner?" (6:00) Have I turned the hands too far? (Yes)
   - Turn all the hands back to 4:15 and turn the hands 1 whole hour to 5:15, counting out loud. Since another hour would be too much time, ask students what to do next. (Count the minutes.)
   - Count the minutes by 5's, 5, 10, 15...45, until the clock reads 6:00. Tell students that the amount of time you will have to wait before eating dinner is 1 hour and 45 minutes.
   - Tell students that we will now solve this problem by subtracting. Display the transparency Regrouping Time. Use a cover sheet so only #1 shows. Read the problem out loud.

$$\begin{array}{r} 6 \text{ hours } 00 \text{ minutes} \\ -\ 4 \text{ hours } 15 \text{ minutes} \\ \hline \end{array}$$

   - Tell students that first the minutes are subtracted and then the hours. Point out the problem has 0 minutes minus 15 minutes. Since 15 can't be subtracted from 0, ask students what to do in order to subtract. (regroup)
   - Tell students that 1 hour must be taken away from the 6 hours and be rewritten as 60 minutes. Ask students why the hour is rewritten as 60 minutes. (There are 60 minutes in 1 hour.) Demonstrate this on the transparency.

$$\begin{array}{r} 5 \quad\ 60 \\ \cancel{6} \text{ hours } \cancel{00} \text{ minutes} \\ -\ 4 \text{ hours } 15 \text{ minutes} \\ \hline \end{array}$$

- Tell students that since the problem now reads 60 minus 15, subtraction can take place. Do the problem together.

$$\begin{array}{rr} 5 & 60 \\ \not{6}\text{ hours} & \not{0}\text{ minutes} \\ -\,4\text{ hours} & 15\text{ minutes} \\ \hline 1\text{ hour} & 45\text{ minutes} \end{array}$$

- Complete #2- #4 together as a class. Solutions are given below.

② $\begin{array}{rr} 7 & 70 \\ \not{8}\text{ hours} & \not{1}0\text{ minutes} \\ -\,2\text{ hours} & 20\text{ minutes} \\ \hline 5\text{ hours} & 50\text{ minutes} \end{array}$

③ $\begin{array}{rr} 9 & 80 \\ \not{1}0\text{ hours} & \not{2}0\text{ minutes} \\ -\,6\text{ hours} & 55\text{ minutes} \\ \hline 3\text{ hours} & 25\text{ minutes} \end{array}$

④ $\begin{array}{rr} 2 & 71 \\ \not{3}\text{ hours} & \not{1}1\text{ minutes} \\ -\,1\text{ hour} & 42\text{ minutes} \\ \hline 1\text{ hour} & 29\text{ minutes} \end{array}$

- Pose the following problem to students. On Saturday Juan worked at the hospital 3 hours 25 minutes in the morning and 2 hours 45 minutes in the afternoon. How many hours did Juan work on Saturday? Ask students how to solve the problem. (Add 3 hours 25 minutes and 2 hours 45 minutes.)
- Uncover #5 on the transparency.

$$\begin{array}{r} 3\text{ hours}\ \ 25\text{ minutes} \\ +\ 2\text{ hours}\ \ 45\text{ minutes} \\ \hline \end{array}$$

- Tell students the minutes are added first and then the hours. Do the computation with the students.

$$\begin{array}{r} 3\text{ hours}\ \ 25\text{ minutes} \\ +\ 2\text{ hours}\ \ 45\text{ minutes} \\ \hline 5\text{ hours}\ \ 70\text{ minutes} \end{array}$$

- Draw students' attention to the 70 minutes in the answer. Ask students if there is a way to rewrite 70 minutes . You might have to give them a hint by asking them how many minutes are in an hour. (70 minutes = 1 hour and 10 minutes)
- Since 7 minutes = 1 hour and 10 minutes and there are already 5 hours in the answer, the answer may be rewritten as 6 hours and 10 minutes. Write this on the transparency.

$$\begin{array}{r} 3\text{ hours}\ \ 25\text{ minutes} \\ +\ 2\text{ hours}\ \ 45\text{ minutes} \\ \hline 5\text{ hours}\ \ 70\text{ minutes} = \\ 6\text{ hours}\ \ 10\text{ minutes} \end{array} \quad \rightarrow 70\text{ minutes} = 1\text{ hour}\ 10\text{ min}$$

- Work together to do #6 - 8. See answers below.

⑥ 5 hours 05 minutes
+ 8 hours 55 minutes
13 hours 60 minutes =
14 hours

⑦ 4 hours 26 minutes
+ 2 hours 35 minutes
6 hours 61 minutes =
7 hours 01 minutes

⑧ 14 hours 53 minutes
+ 6 hours 29 minutes
20 hours 82 minutes =
21 hours 22 minutes

- Distribute Find the Time to students. Go over the directions. Have students complete the activity sheet.

Name _____

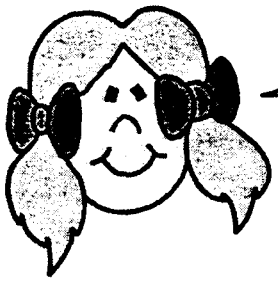
Converting Units of Time

Divide to convert from smaller units to larger units

seconds to minutes
minutes to hours
hours to days

Multiply to convert from larger units to smaller units

days to hours
hours to minutes
minutes to seconds



Remember:
60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day

Helpful Hints:
2 days = 48 hours
3 days = 72 hours
4 days = 96 hours
5 days = 120 hours

Fill in the blank with the correct unit of time.

1. 480 minutes = _____ hours
2. 360 seconds = _____ minutes
3. 96 hours = _____ days
4. 540 minutes = _____ hours
5. 4 hours = _____ minutes
6. 11 minutes = _____ seconds
7. 8 days = _____ hours
8. 12 hours = _____ minutes

9. 320 minutes = _____ hours _____ minutes

10. 82 hours = _____ days _____ hours

11. 450 seconds = _____ minutes _____ seconds

12. 630 minutes = _____ hours _____ minutes

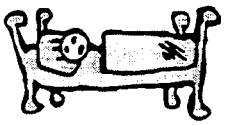
13. 28 minutes 14 seconds = _____ seconds

14. 5 hours 30 minutes = _____ minutes

15. 14 days 3 hours = _____ hours

16. 15 minutes 45 seconds = _____ seconds

Last night Kareem slept for 8 hours. Simran slept for 500 minutes.



1. Who slept longer? _____

2. How much longer? _____

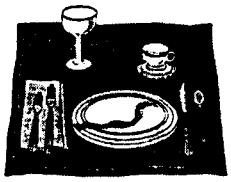
Test your sense of time.
Circle the best estimate.

1. The time to eat dinner

5 minutes

2 hours

30 minutes



2. The time to run 2 miles

20 minutes

45 seconds

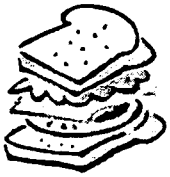
1 hour

3. The time to make a sandwich

2 seconds

2 minutes

20 minutes

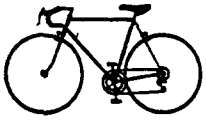


4. The time to ride a bike 10 miles

1 hour

10 minutes

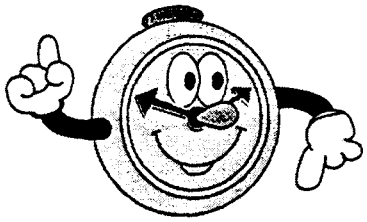
10 hours



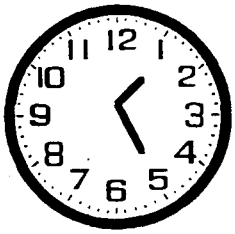
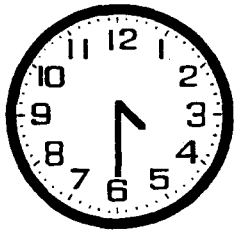
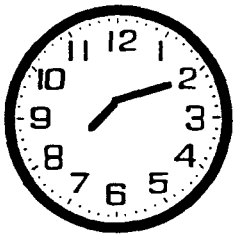
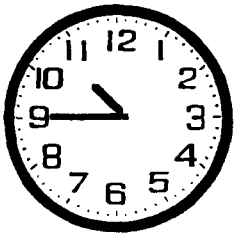
Name _____

How Much Time Has Passed?

First, count the hours.



Then, count the minutes.

	START TIME	END TIME	
Example			**Think:** 12 hours 37 minutes (end) -- 10 hours 07 minutes (start) **Answer:** 2 hours 30 minutes
1.	10:07	12:37	
2.			_____
3.	1:00	2:15	_____
4.			_____
5.	1:42	3:50	_____

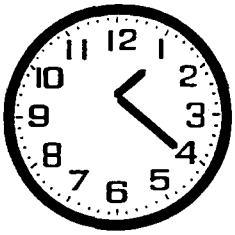
Name _____

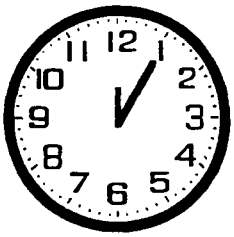
What Will the Time Be?

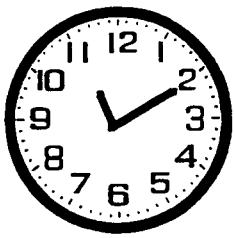
Example: 7: 30 in 20 minutes

Think: 7 hours 30 minutes
+ 20 minutes
7 hours 50 minutes

Answer: 7:50

1. 
in 30 minutes?

2. 
in 5 hours?

3. 
in 45 minutes?

1 hour 20 minutes
+
_____

_____ _____ _____

4. 1:35
in 4 hours and 10 minutes?

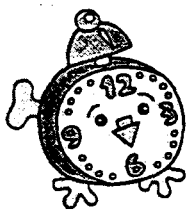
5. 6:20
in 2 hours and 15 minutes?

6. 2:15
in 8 hours and 5 minutes?

_____ _____ _____

Name _____

Passing Time



Read each problem carefully.
Solve the problem.
Make sure the answer fits the question asked.

1. The sixth grade class went to the art gallery. They left school at 8:05 a.m. and returned at 11:45 a.m. How much time was the class gone?

2.  Marla arrived at the mall at 2:45 p.m. She spent 2 hours and 10 minutes shopping. What time did Marla leave the mall?

3. Luis began mowing the lawn at 12:05 p.m. He finished mowing at 12:50 p.m. How long did it take for Luis to mow the lawn?

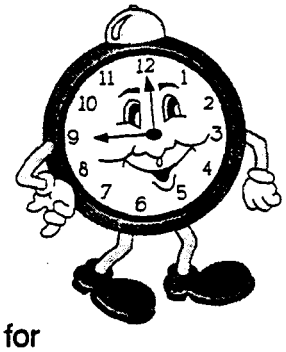
4.  Soccer practice begins at 3:00 p.m. It lasts for 2 hours and 20 minutes. What time is soccer practice over?

5.  Lana started swimming lessons at 5:15 p.m.. She finished her swimming lesson at 6:35 p.m.. How long was Lana's swimming lesson?

6. On Saturday, Mona babysat her niece from 1:20 p.m. until 4:45 p.m. How many hours did she babysit?

7. The movie began at 5:42 p.m. It lasted 2 hours and 14 minutes. What time was the movie over?

8. What time is it 8 hours and 12 minutes after 9:07 a.m.?



A. 5:19 p.m.
B. 5:19 a.m.
C. 6:19 p.m.

Use the following information to solve problems 9 and 10.

The time is now 2:40 p.m. The play has been going on for 1 hour and 15 minutes. It is over at 4:30 p.m.

9. What time did the play start?

A. 1:35 p.m.
B. 12:25 p.m.
C. 1:25 p.m.

10. How long is the play?

A. 4 hours 5 minutes
B. 3 hours 5 minutes.
C. 3 hours 15 minutes

Complete the table below.
Write in the **time** David did each activity.

Activity	When	Time
Got up		6:45 a.m.
Ate breakfast	30 minutes later	
Went to school	35 minutes later	
Had lunch	4 hours 10 minutes later	
Got home from school	3 hours 25 minutes later	

Regrouping Time

① 6 hours 00 minutes
− 4 hours 15 minutes

② 8 hours 10 minutes
− 2 hours 20 minutes

③ 10 hours 20 minutes
− 6 hours 55 minutes

④ 3 hours 11 minutes
− 1 hour 42 minutes

⑤ 3 hours 25 minutes
+ 2 hours 45 minutes

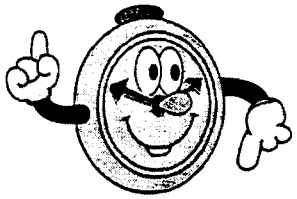
⑥ 5 hours 05 minutes
+ 8 hours 55 minutes

⑦ 4 hours 26 minutes
+ 2 hours 35 minutes

⑧ 14 hours 53 minutes
+ 6 hours 29 minutes

Name_____

Find the Time



1 hour = 60 minutes
or
60 minutes = 1 hour

Example A

6 h 35 min
+ 2 h 31 min
8 h 66 min

Think: 60 min = 1 h

66 min
- 60 min (1 h)
6 min

So 66 min = 1 h 6 min

8 h + 1 h 6 min =
9 h 6 min
Answer

Example B

8 h 20 min
- 6 h 37 min

Think: You cannot subtract 37 from 20. You need to regroup.

Remember: 1 h = 60 min

Regroup: **7 80**
~~8~~ h ~~20~~ min
6 h 37 min
Answer **1 h 43 min**

Add or subtract.

1. 11 h 25 min
+ 4 h 45 min

2. 4 h 16 min
+ 3 h 22 min

3. 11 h 15 min
- 8 h 25 min

4. 12 h 37 min
- 6 h 23 min

5.
$$\begin{array}{r} 4\text{ h } 35\text{ min} \\ -\ 1\text{ h } 50\text{ min} \\ \hline \end{array}$$

6.
$$\begin{array}{r} 9\text{ h } 12\text{ min} \\ -\ 3\text{ h } 24\text{ min} \\ \hline \end{array}$$

7.
$$\begin{array}{r} 7\text{ h } 11\text{ min} \\ +\ 4\text{ h } 56\text{ min} \\ \hline \end{array}$$

8.
$$\begin{array}{r} 10\text{ h } 28\text{ min} \\ +\ 2\text{ h } 32\text{ min} \\ \hline \end{array}$$

9.
$$\begin{array}{r} 13\text{ h } 19\text{ min} \\ +\ 11\text{ h } 46\text{ min} \\ \hline \end{array}$$

10.
$$\begin{array}{r} 14\text{ h } 34\text{ min} \\ -\ 10\text{ h } 44\text{ min} \\ \hline \end{array}$$

11. Tom worked on the computer for 2 hours and 15 minutes on Monday. On Tuesday he worked on the computer for 1 hour and 50 minutes. How many hours did Tom work on the computer?

12. Letty started calling her friends on the phone at 1:40 p.m. She finished using the phone at 4:00 p.m. How long was Letty on the phone?

Answer Key
Measurement - Obj. 9

Converting Units of Time

1. 8 hours
2. 6 minutes
3. 4 days
4. 9 hours
5. 240 minutes
6. 660 seconds
7. 192 hours
8. 720 minutes
9. 5 hours 20 minutes
10. 3 days 10 hours
11. 7 minutes 30 seconds
12. 10 hours 30 minutes
13. 1,694 seconds
14. 330 minutes
15. 339 hours
16. 945 seconds

1. Simran
2. 20 minutes

1. (30 minutes)
2. (20 minutes)
3. (2 minutes)
4. (1 hour)

How Much Time Has Passed?

2. 3 hours 5 min
3. 1 hour 15 min
4. 2 hours 35 min
5. 2 hours 8 min

What Will the Time Be?

1. 1:50
2. 5:05
3. 11:55
4. 5:45
5. 8:35
6. 10:20

Passing Time

1. 3 hours 40 minutes
2. 4:55 p.m.
3. 45 minutes
4. 5:20 p.m.
5. 1 hour 20 minutes
6. 3 hours 25 minutes
7. 7:56 p.m.
8. A. 5:19 p.m.
9. C. 1:25 p.m.
10. B. 3 hours 5 minutes

Time
6:45 a.m.
7:15 a.m.
8:50 a.m.
12:00 p.m.
3:25 p.m.

Find the Time

1. 16 h 10 min	2. 7 h 38 min	3. 2 h 50 min	4. 6 h 14 min
5. 2 h 45 min	6. 5 h 48 min	7. 12 h 7 min	8. 13 h
9. 25 h 5 min	10. 3 h 50 min	11. 4 h 5 min	12. 2 h 20 min

Objective 10: Compare times in different zones.

Vocabulary

globe
rotate
time zones
eastern time zone
central time zone
mountain time zone
pacific time zone
east
west
increases
decreases

Materials

globe
flashlight
masking tape

Transparencies:

USA Time Zones

Student Copies:

USA Time Zones
"Time, Please"
Across the Miles

Language Foundation

1. If possible, obtain a map of the world time zones. Have students find their home countries on the globe and do different time comparisons. For example, if it is 10 a.m. in Virginia, what time is it in _____? This could be turned into a language activity with students writing about different times of the day and what they are doing versus what a relative or friend in their home country might be doing.

2. Have a discussion with students about what they know regarding time differences. Many students will be able to relate personal experiences they have had with time differences i.e. making phone calls home, traveling home or watching a live broadcast from their countries.

3. Many students will come from countries that do not have different time zones. This could be a topic of discussion with students. Explain that the United States has to have different time zones because it takes the sun three hours to cross it.

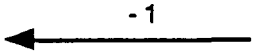
4. Students may have trouble with the problems involving plane travel. It might help to have students figure out what time it is in the departing city when the plane lands and then convert it to the local time.

Mathematics Component

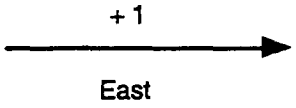
1. Define time zones.
   - Show students a globe. Ask them what it is called. (If they do not know the name, tell them it is called a globe and have them repeat the word after you.) The globe represents the earth. Discuss the globe and ask students to locate their home countries, continents, oceans, the United States, etc.
   - Tell them the earth **rotates,** or turns around a center point. Illustrate rotating with the globe.
   - Further illustrate the word rotate by turning yourself around in place, emphasizing how you turn from a center point. Have students rotate twice and repeat the word rotate.
   - Ask students how the earth gets its light. (the sun) Tell students that as the earth rotates, the sun shines on different sections of the earth. The rotation of the earth affects the time. There is light during the day and darkness at night.
   - Give a student volunteer a flashlight. Tell the class that the flashlight represents the sun. Turn the flashlight on and have student shine it on the globe. (If possible, turn off the lights in the room to enhance the effect of the flashlight on the globe.) As the flashlight (sun) remains stationary, slowly rotate the globe so the students can see that the sun shines on only part of the earth at a time.
   - Stop the globe with the sun shining on the United States. Ask students if it is day or night in the United States. (day) With the globe and the sun (flashlight) in the same position, point out India on the globe. Ask students if it is day or night in India. (night) Ask students if the time is the same in the United States as it is in India. (No, because it is day in the United States and night in India so the time could not possibly be the same.)
   - Set aside the flashlight.
   - Ask students how many hours are in a day. (24) Tell students that since there are 24 hours in a day, the earth has been divided into 24 **time zones**. Show the time zones by drawing the lines on the globe with your finger.
   - Locate northern Virginia on the globe. Tell students it is 6:00 a.m. in northern Virginia. Put a piece of masking tape (loop the tape and stick both ends to the globe) so it sticks up to mark northern Virginia on the globe.
   - Locate California on the globe. Tell students it is 3:00 a.m. in California. Put another piece of masking tape to mark California.
   - Again, have a student volunteer hold the flashlight to represent the sun. Turn the globe so the flashlight (sun) is just beginning to shine on northern Virginia.
   - Tell students that northern Virginia and the surrounding area (point it out on the globe) are just beginning to receive sunlight. It is 6:00 a.m. Tell students that this area makes up one time zone called the **Eastern Time Zone**.
   - Slowly rotate the globe until the flashlight (sun) begins to shine on California. Tell students it takes 3 hours for the globe to rotate this far.

- Tell students that California and the surrounding area (point it out on the globe) are now just beginning to receive sunlight. It is 6:00 a.m. in California, and the sun is coming up. Tell students that California and the surrounding area make up a time zone called the **Pacific Time Zone.**
- Ask students what time it is now in northern Virginia. Remind them it took 3 hours for the earth to rotate so the sun was coming up in California. Tell students that it is 3 hours later or 9:00 a.m. Point to the globe as you say, "When it is 9:00 a.m. in northern Virginia, it is 6:00 a.m. in California."
- Do a few more examples with the students concerning the time difference between northern Virginia and California. Make sure students understand the time in northern Virginia is always 3 hours later than the time in California.
- Many students have had experiences with time differences when making international phone calls or traveling. Have a short discussion with students on these topics so they can relate time differences to their prior experiences.

2. Compare time in different time zones.
   - Put the USA Time Zones transparency on the overhead and give each student a copy.
   - Tell students there are 4 time zones in the mainland United States. Each time zone represents a one hour time difference.
   - Point to the words **Eastern Time Zone.** Tell students that the area or states in the eastern part of the United States are in the Eastern Time Zone. Use your finger to trace the dividing line on the map as you indicate the area covered by the Eastern Time Zone.
   - Point to the words **Central Time Zone.** Tell students that the area or states in the central or middle part of the United States are in the Central Time Zone. Use your finger to trace the dividing lines on the map as you indicate the area covered by the Central Time Zone.
   - Point to the words **Mountain Time Zone.** Tell students that the area or states in the part of the United States where there are big mountains are in the Mountain Time Zone. Use your finger to trace the dividing lines on the map as you indicate the area covered by the Mountain Time Zone.
   - Point to the words **Pacific Time Zone.** Tell students that the area or states close to the Pacific Ocean are in the Pacific Time Zone. Use your finger to trace the dividing line on the map as you indicate the area covered by the Pacific Time Zone.
   - Point to the the time written below the words Eastern Time Zone. Ask a student to read the time. (4:00)
   - Move west (left) across the country. Have students read the time under each time zone.
   - Ask students if they see a pattern in the times as you go to the west. (As we go west (left) the time decreases by one hour for each time zone.) Have students draw an arrow pointing west (left) at the top of their map with -1 above it as you draw it on the transparency. Write **west** below the arrow.



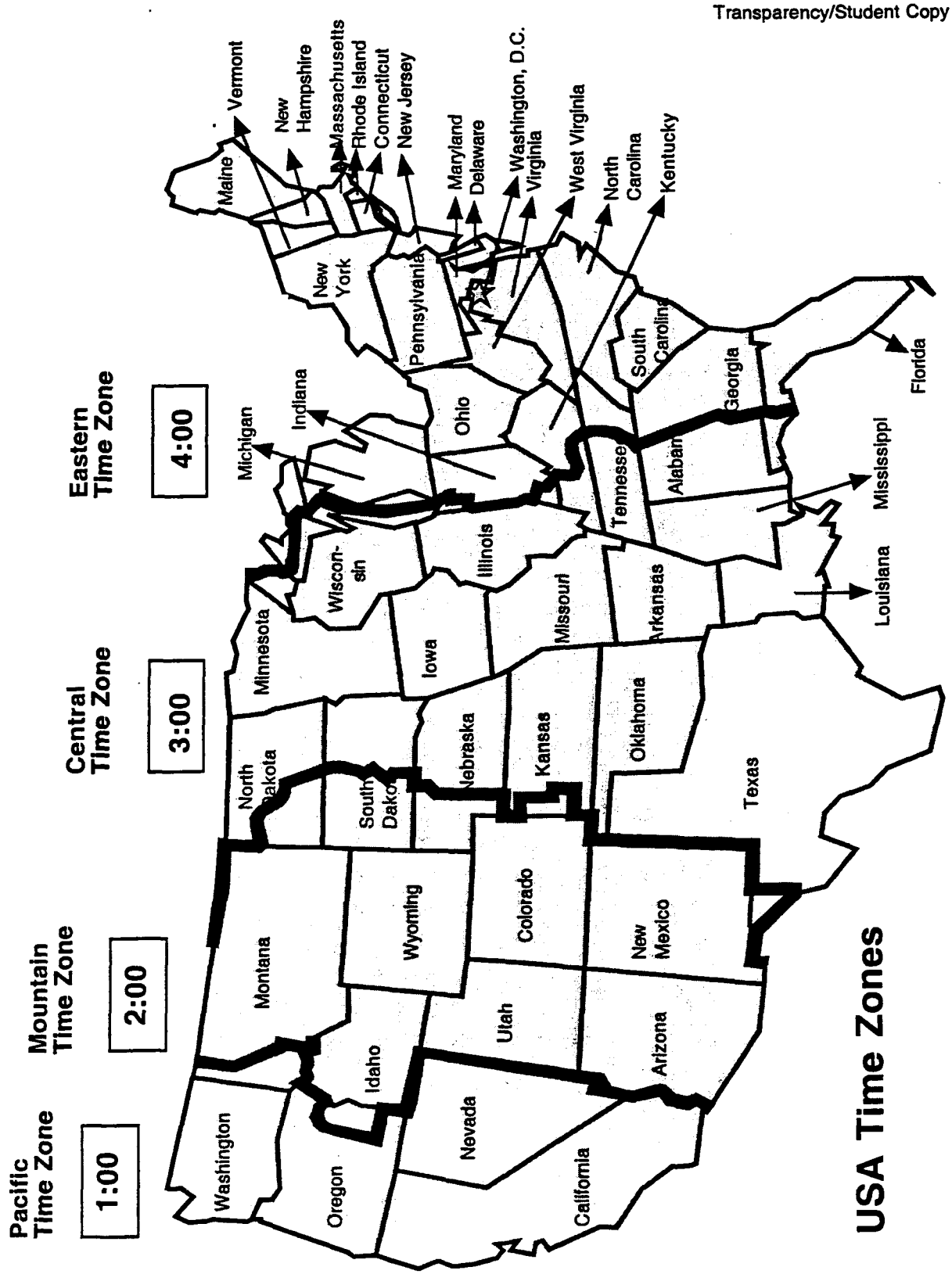
- Point to the time written below the words Pacific Time Zone. Ask a student to read the time. (1:00)
- Move east (right) across the country. Have students read the time under each time zone.
- Ask students if they see a pattern in the times as you go to the east. (As we go east (right) the time increases by one hour for each time zone.) Have students draw an arrow pointing east (right) at the top of their map with +1 above it as you draw it on the transparency. Write **east** below the arrow.



- Ask students to find Virginia on the map. (Check to make sure students have located Virginia.) Ask students to identify the time zone of Virginia. (Eastern)
- Ask students to find Arizona on the map. (Check to make sure students have located Arizona.) Ask students to identify the time zone of Arizona. (Mountain)
- Tell students it is 8:00 p.m. in Virginia. Ask students what the time is in Arizona. (6:00 p.m.) Point out to students that since you are moving to the west or to the left (point to the arrow on the overhead map) that the time decreases 1 hour for each time zone. Say as you point to the overhead map, "I start in Virginia in the Eastern Time Zone. It is 8:00 p.m. I move one (move finger to the Central Time Zone), two (move your finger to the Mountain Time Zone) time zones to Arizona. 8:00 p.m. - 2 hours = 6:00 p.m. It is 6:00 p.m. in Arizona."
- Repeat above procedure with the following questions. Make sure students subtract when moving to the west and add when moving to the east.

1. If it is 10:00 a.m. in Texas, what time is it in Oregon? (8:00 a.m.)
2. If it is 12:00 noon in Illinois, what time is it in Colorado? (11:00 a.m.)
3. If it is 2:00 a.m. in Georgia, what time is it in Alabama? (1:00 a.m.)
4. If it is 5:00 p.m. in Washington, what time is it in Massachusetts? (8:00 p.m.)
5. If it is midnight in Pennsylvania, what time is it in Wisconsin? (11 p.m.)
6. If it is 8:00 a.m. in Wyoming, what time is it in Maryland? (10:00 a.m.)

- Distribute "Time, Please." Go over directions with students. Have them use USA Time Zones to complete the worksheet.
- Across the Miles is included for further practice. Have students use USA Time Zones to complete the worksheet.


USA Time Zones
Pacific Time Zone
1:00
Mountain Time Zone
2:00
Central Time Zone
3:00
Eastern Time Zone
4:00
Washington
Oregon
California
Idaho
Nevada
Montana
Wyoming
Utah
Colorado
Arizona
New Mexico
North Dakota
South Dakota
Nebraska
Kansas
Oklahoma
Texas
Minnesota
Iowa
Missouri
Arkansas
Louisiana
Wisconsin
Illinois
Michigan
Indiana
Ohio
Tennessee
Mississippi
Alabama
Georgia
Florida
South Carolina
North Carolina
Kentucky
West Virginia
Virginia
Washington, D.C.
Maryland
Delaware
Pennsylvania
New York
Maine
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticut
New Jersey

Name _____

"Time, Please"

Use **USA Time Zones** map to help you find the following times.

1. If it is 1:00 p.m. in the **Pacific Time Zone**, what time is it in the _____ ?

   Eastern Time Zone _____

   Central Time Zone _____

   Mountain Time Zone _____

2. If it is 10:00 p.m. in the **Eastern Time Zone**, what time is it in the _____ ?

   Central Time Zone _____

   Mountain Time Zone _____

   Pacific Time Zone _____

3. If it is 3:00 p.m. in the **Mountain Time Zone**, what time is it in the _____ ?

   Eastern Time Zone _____

   Central Time Zone _____

   Pacific Time Zone _____

4. If it is 11:00 a.m. in the **Central Time Zone**, what time is it in the _____ ?

   Eastern Time Zone _____

   Mountain Time Zone _____

   Pacific Time Zone _____

5. If it is 7:00 a.m. in **Virginia**, what time is it in _____ ?

 Colorado _____

 Maryland _____

 Texas _____

 California _____

6. If it is 8:00 a.m. in **Nevada**, what time is it in _____ ?

 New York _____

 Arizona _____

 Illinois _____

 South Carolina _____

7. If it is 2:00 p.m. in **Missouri**, what time is it in _____ ?

 Washington _____

 New Mexico _____

 Oklahoma _____

 Maine _____