Math Wizards

Grade 3 Measurement

Unit One

Name:_____

Ontario Mathematics Curriculum Grades 1 to 8, 1997
Strand: Measurement
Grade: 3

Overall Expectations:
- demonstrate an understanding of and ability to apply measurement terms: centimetre, metre, kilometre; millilitre, litre; gram, kilogram; degree Celsius; week, month, year
- identify relationships between and among measurement concepts
- solve problems related to their day-to-day environment using measurement and estimation (eg. in finding the height of the school fence)
- estimate, measure, and record the perimeter and the area of two-dimensional shapes, and compare the perimeters and areas
- estimate, measure, and record the capacity of containers and the mass of familiar objects, and compare the measures

** All specific expectations are covered with the exception of the following, which are covered in the “everyday math” unit.
M6:estimate and measure the passage of time in five-minute intervals, and in days, weeks, months, and years
M11:make purchases and change for money amounts up to $10, and estimate, count and record the value up to $10 of a collection of coins and bills

Measurement
Measuring on You!

As a class, let's read the book Counting on Frank by Rod Clement.

I used _____ as a non-standard measuring unit to measure the line.

Merlin has a problem!

Benjamin is taller than Merlin. Gweneth is shorter than Charlotte. Charlotte is shorter than Merlin. Who is the tallest? Who is the shortest?

Grade 3 Mactivity001 covers:
M2:select the most appropriate unit of measure to measure length (centimetre, metre, kilometre)

Measurement
Standard Units

Let's look at a metre. What could you use on your body to represent a metre?

_____

What is the short form for metre?_____

Let's look at a centimetre. What could you use on your body to represent a centimetre?_____

How many centimetres are in a metre?_____

What's the short form for centimetre?_____

Let's look at a millimetre. What could you use on your body to represent a millimetre?_____

How many millimetres are in a centimetre?_____

How many millimetres are in a metre?_____

What is the short form for millimetre?_____

If metres, centimetres and millimetres are standard units, what would we call our body measures? _____

Why would we use standard units?

_____

_____

_____

Draw a picture of something that is about . . .

. . . a metre long	. . . a centimetre long	. . . a millimetre long

Grade 3 Mactivity002 covers:
M1:explain the use of standard units of measurement and the relationships between linear measures (eg. millimetres are smaller than metres)

Measurement
Let's Measure it UP!

Pick various objects from around the classroom. Estimate the length of the objects. Measure the length of these objects. Record your work in the chart below.

Object	Estimation	Measurement (remember your units)

Grade 3 Mactivity003 covers:
M2:select the most appropriate unit of measure to measure length (centimetre, metre, kilometre)
M3:estimate, measure, and record linear dimensions of objects (using centimetre, metre, kilometre)

Measurement
Biggest to Smallest

Pick FIVE objects from around the classroom. Order them from biggest to smallest. Measure them using the best measure of standard units. Record your work in the charts below.

	Biggest				Smallest
Object					
Length (remember units)					

	Biggest				Smallest
Object					
Length (remember units)					

	Biggest				Smallest
Object					
Length (remember units)					

	Biggest				Smallest
Object					
Length (remember units)					

Grade 3 Mactivity004 covers:
M2:select the most appropriate unit of measure to measure length (centimetre, metre, kilometre)
M3:estimate, measure, and record linear dimensions of objects (using centimetre, metre, kilometre)
M4:compare and order objects by their linear dimensions

Measurement
Biggest to Smallest

Pick FIVE objects from around the classroom. Order them from biggest to smallest. Measure them using the best measure of standard units. Record your work in the charts below.

	Biggest				Smallest
Object					
Length (remember units)					

	Biggest				Smallest
Object					
Length (remember units)					

Merlin has a Problem!

In a race, Basil was 6m behind Merlin. Olivia was 7m ahead of Charlotte. Charlotte was 2m ahead of Merlin. Who finished first, second, third and fourth?

Grade 3 Mactivity005 covers:
M2:select the most appropriate unit of measure to measure length (centimetre, metre, kilometre)
M3:estimate, measure, and record linear dimensions of objects (using centimetre, metre, kilometre)
M4:compare and order objects by their linear dimensions

Measurement
Perimeter

What is perimeter?

_____

_____

_____

_____

As a class, let's measure the perimeter of our carpet using our shoes.

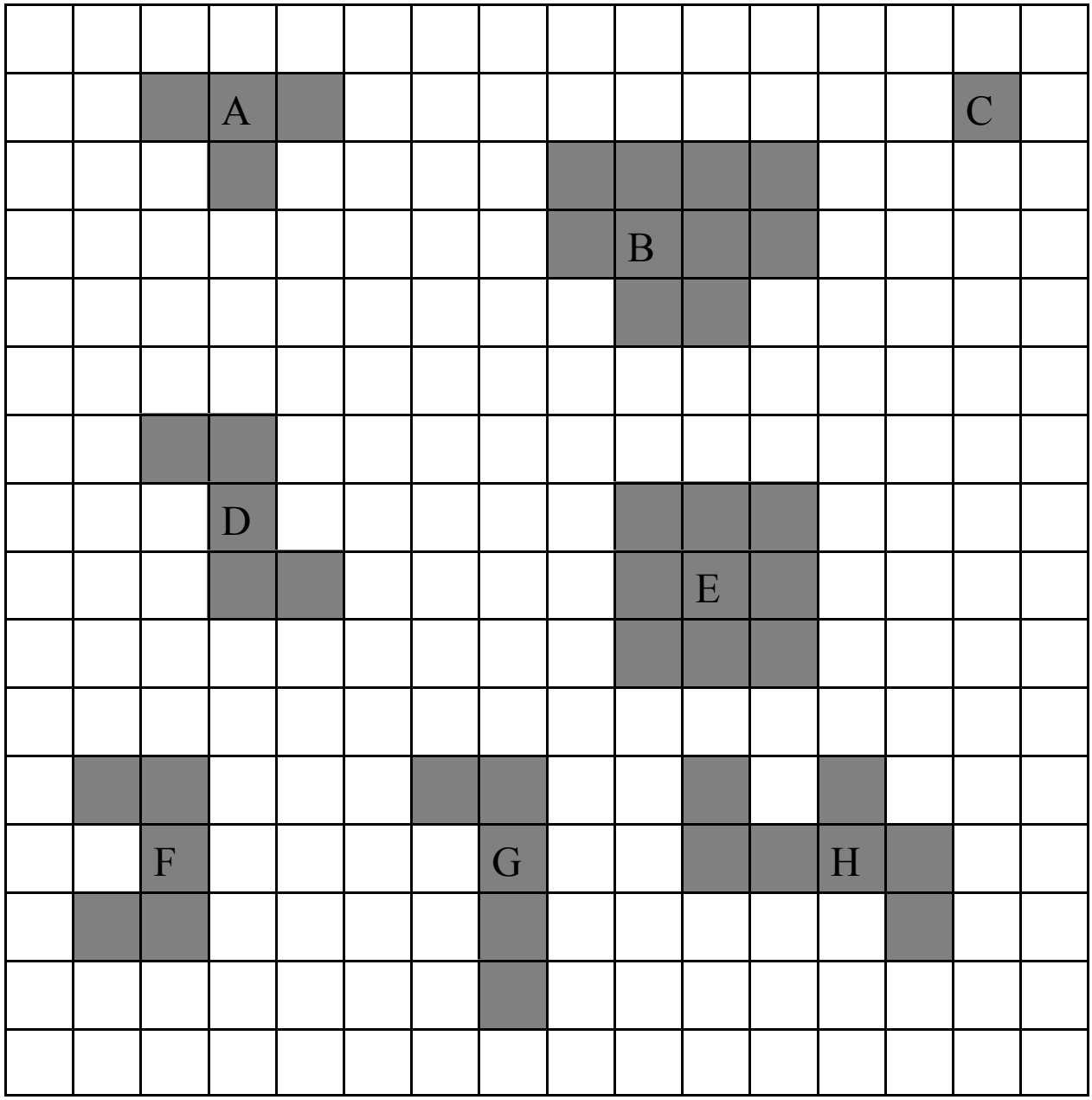
The perimeter of our carpet is _____ shoes.

Pick another non-standardized object and measure the perimeter of your desk.

The perimeter of my desk is _____.

Grade 3 Mactivity006 covers:
M13:measure the perimeter of two-dimensional shapes using standard units (centimetre and metre), and compare the perimeters.

Measurement
Perimeter



Object	A	B	C	D	E	F	G	H
Perimeter								

Which object has the largest perimeter?_____

Which object has the smallest perimeter? _____

Merlin has a Problem!

Merlin has a shape with a perimeter of 12cm. The sides are all equal. The sum of half the sides is equal to 6cm. How many sides does the shape have? What shape does Merlin have?

Grade 3 Mactivity007 covers:
M13:measure the perimeter of two-dimensional shapes using standard units (centimetre and metre), and compare the perimeters

Measurement
Let's Measure Perimeter

Basil has a challenge for you. With various objects around the classroom, estimate the perimeter, then measure the perimeter. Remember to include your units (cm or m).
How do you measure perimeter?_____

Object	Estimate Perimeter	Real Perimeter

Place the objects in order from the smallest perimeter to the largest perimeter:

smallest								largest

Grade 3 Mactivity008 covers:
M13:measure the perimeter of two-dimensional shapes using standard units (centimetre and metre), and compare the perimeters

Measurement
Area

What is area?

_____

_____

As a class, let's meet at the carpet and measure the area of the carpet, using pieces of construction paper.

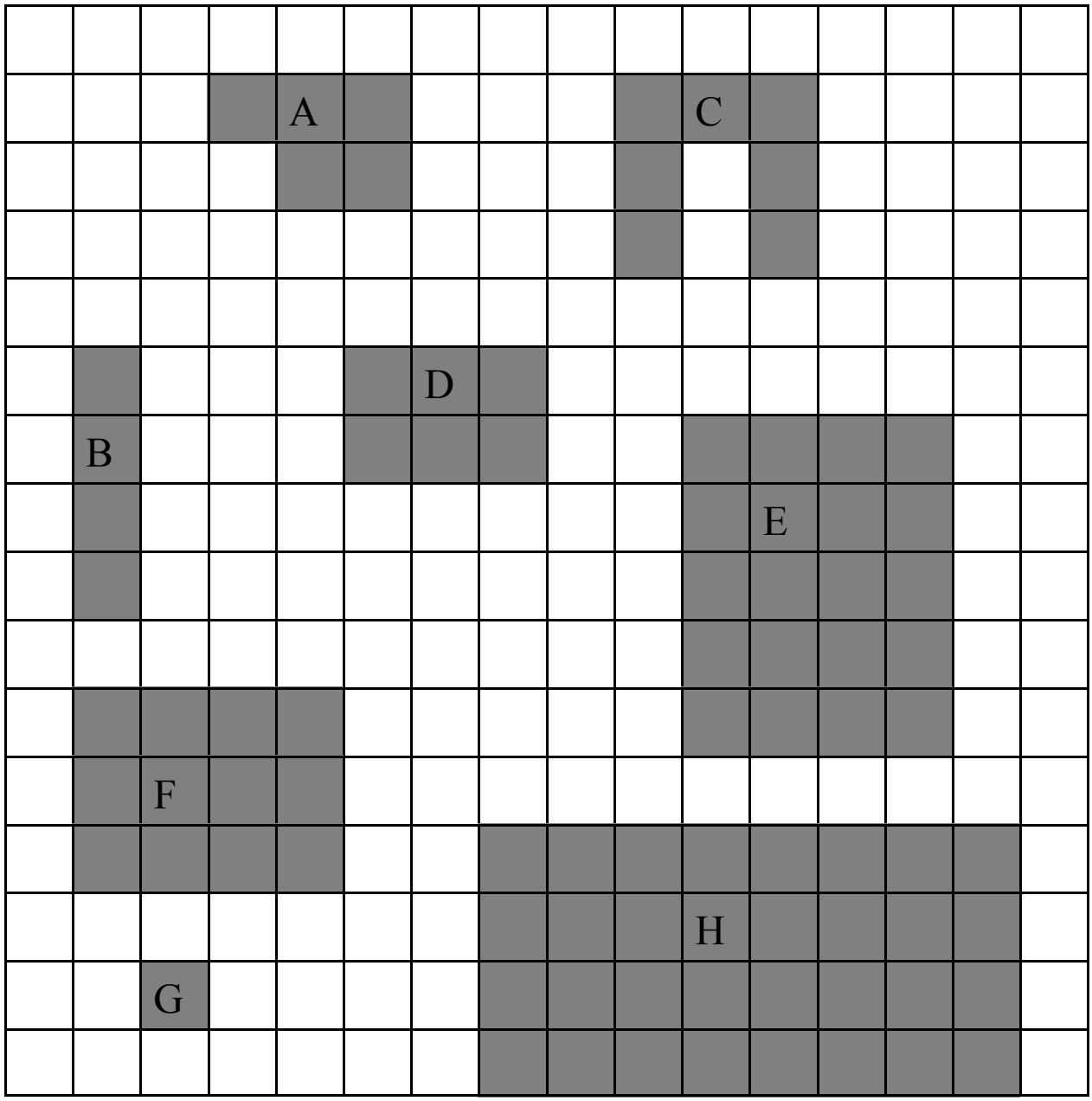
The area of our carpet is _____ pieces of construction paper.

Back at your desk, trace your hand in the box below. Using an appropriate non-standard unit, measure the area of your hand.

The area of my hand is _____.

Grade 3 Mactivity009 covers:
M14:estimate and measure the area of shapes using uniform non-standard units, and compare and order the shapes by area.

Measurement
Area



Object	A	B	C	D	E	F	G	H
Area								

Which object has the smallest area?_____

Which object has the largest area?

Grade 3 Mactivity010 covers:
D14:estimate and measure the area of shapes using uniform non-standard units, and compare and order the shapes by area.

Measurement
The Area of Classroom Objects

Pick out five classroom objects. Knowing that you'll measure the area of each object using lima beans, estimate the lima bean area of each object. Measure the area of each object using lima beans and complete the chart below.

Object					
Estimate					
Area					

Were your estimates accurate?

_____

_____

What is the hardest part about measuring area?

_____

_____

_____

_____

_____

How would you standardize measuring area?

_____

_____

_____

_____

_____

Order the objects from the largest area to the smallest area:

largest				smallest

Grade 3 Mactivity011 covers:
M14:estimate, measure the area of shapes using uniform non-standard units, and compare and order the shapes by area

Measurement
How would you weigh an elephant?

As a class, let's read Weighing the Elephant by Ting-Xing Ye and Illustrated by Suzane Langlois.

How did Hei-do weigh the elephant?

_____
_____
_____

What are some of the things we weigh everyday?

_____
_____
_____

Merlin has a Problem!

Merlin is travelling to the Bermuda triangle for a vacation. He is only allowed to take 20 kg of luggage on the airplane. Suppose Merlin packs at least 5 kg in each suitcase. How could he divide the 20 kg of luggage among 3 suitcases?

Grade 3 Mactivity012 covers:
M16:estimate, measure, and record the mass of familiar objects using standard units (gram, kilogram)

Measurement
Let's Mass!

Basil has placed some objects at the front of the class. Fill in the chart below by following Basil's steps.
Step 1: Choose eight objects.
Step 2: Write the names of the objects under the object column.
Step 3: Guess what the mass of the object is and write it down.
Step 4: Measure the mass using our scale and write down the "For Real" mass.

Object	Your Guesstimate	For Real

What was the heaviest object? _____

What was the lightest object? _____

What was the hardest part of weighing objects?

_____

_____

_____

Grade 3 Mactivity013 covers:
M16estimate, measures, and record the mass of familiar objects using standard units (gram, kilogram)

Measurement
Capacity

What is capacity?

_____
_____
_____
_____

As a class, let's measure the capacity of this jar with different non-standard units. Be sure to record our estimates and measures in the chart below:

Non-Standard Unit of Measure	**Estimate**	**Capacity of the jar**

Now let's measure our jar using a standard measure. There are two standard units of measure for capacity, millilitre (mL) and litre (L). There are 1000 mL in one L.

We are going to use mL to measure the capacity of our jar. To do this we fill our jar with water and using an instrument called a graduated cylinder.

The capacity of our jar is _____ mL.

Draw the procedure for measuring capacity in standard units below:

Grade 3 Mactivity014 covers:
M15:estimate, measure, and record the capacity of containers using standard units (millilitre, litre), and compare the measures

Math Wizards
Let's Capacitize!

Basil has placed some containers at the front of the class. Fill in the chart below by following Basil's steps.
Step 1: Choose eight containers.
Step 2: Write the names of the containers under the object column.
Step 3: Guess what the containers capacity is and write it down.
Step 4: Measure the capacity using our capacity instruments and write down the "For Real" capacity.

Object	Your Guesstimate	For Real

Put the objects in order from largest capacity to smallest:

largest							smallest

Grade 3 Mactivity015 covers:
M15:estimate, measure, and record the capacity of containers using standard units (millilitre, litre), and compare the measures

Measurement
Alexander!

As a class, let's read Alexander, Who Used to Be Rich Last Sunday by Judith Viorst and Illustrated by Ray Cruz.

Retell what happened to Alexander's money in the story.

Alexander started with one dollar. It was a gift from his grandparents.	
Alexander bought bubble gum for 15¢.	Draw how much money he had left: Alexander had _____¢ left.
Alexander lost 15¢ to Anthony because he couldn't hold his breath, jump to the top of a stoop or trick his mom.	Draw how much money he had left: Alexander had _____¢ left.
Alexander rented Eddie's snake for 12¢.	Draw how much money he had left: Alexander had _____¢ left.
Alexander was fined 10¢ because he said bad words.	Draw how much money he had left: Alexander had _____¢ left.

Alexander flushed 3¢ down the toilet and a nickel fell down a floor crack (along with a butter knife and his mom's scissors).	Draw how much money he had left: Alexander had _____¢ left.
Alexander had to give Anthony 11¢ for eating his chocolate bar.	Draw how much money he had left: Alexander had _____¢ left.
He lost 4¢ to Nick's disappearing magic trick.	Draw how much money he had left: Alexander had _____¢ left.
Alexander was fined 5¢ for kicking.	Draw how much money he had left: Alexander had _____¢ left.
Alexander spent 20¢ at Cathy's garage sale.	Draw how much money he had left: Alexander had _____¢ left.

Grade 3 Mactivity016 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
Writing Money Amounts

	
The amount of money above can be written like: 67¢ OR $0.67	Write the amount of money above in the two different forms.

Let's practice:

¢		56¢	32¢			61¢		99¢
$	$0.89			$0.24	$0.45		$0.75	

Merlin has a Problem!

Merlin is trying to find the best value on slugs at the magic potions store. One pack of 4 slugs costs $3.99, another pack of 6 slugs costs $4.99. Which pack of slugs would be a better value?

Grade 3 Mactivity017 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
So Smart!

As a class, let's read the poem "Smart" by Shel Silverstein.

Retell what happened to the money in the poem.

Started with a dollar	
Traded the dollar for two quarters.	Draw how much money he had left: He had _____¢ left and lost _____¢.
Traded the two quarters for three dimes.	Draw how much money he had left: He had _____¢ left and lost _____¢.
Traded the three dimes for four nickels.	Draw how much money he had left: He had _____¢ left and lost _____¢.
Traded the four nickels for five pennies.	Draw how much money he had left: He had _____¢ left and lost _____¢.

Grade 3 Mactivity018 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
Merlin has Problems!

Merlin has a Problem!

Merlin has 8 coins in his pocket. They total 72¢. What coins does Merlin have?

Merlin has a Problem!

Merlin owes Basil 50¢. List 3 combinations of coins that Merlin could use to repay Basil.

Grade 3 Mactivity019 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
Merlin has Problems!

Merlin has a Problem!

Merlin bought a plant for $3.50. He paid with a five dollar bill. How much change will Merlin get? What coins might the cashier give Merlin for change?

Merlin has a Problem!

Merlin had $1.00. He bought a can of addition potion for 60¢. Merlin got 3 coins back as change. What coins did he get?

Grade 3 Mactivity020 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
Merlin has Problems!

Merlin has a Problem!

Merlin and Olivia have each saved some money. Basil promised to give them enough money so that they would both have 75¢ each. Merlin has 3 dimes and 3 pennies. How much does Basil have to give Merlin. Olivia has the amount that Basil gave Merlin. How much more does Olivia need?

Merlin has a Problem!

Merlin was offered $8.00 to rake the school grounds. On the first day, Merlin raked half the yard. On the second day, Merlin asked a friend for help. Merlin and his friend finished raking the yard. How much should Merlin pay his friend?

Grade 3 Mactivity021 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
Merlin has Problems!

Merlin has a Problem!

Basil and Merlin take turns doing chores. They earn 1 quarter every time they set the table and 2 quarters every time they wash the dishes. For the last 2 nights, Basil washed the dishes and Merlin set the table. Who earned more money? How much more?

Merlin has a Problem!

Merlin is saving money to buy a new wand that costs $5.00. He has $3.70 already. He saves 10¢ a day. In how many days will he have enough money to buy the wand?

Grade 3 Mactivity022 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
Merlin has Problems!

Merlin has a Problem!

Merlin has 35¢ in his bank. He adds 1 dime everyday. Will he have more or less than one dollar after 10 days?

Merlin has a Problem!

Basil and Merlin had a party. Basil bought a cake for $9.00. Merlin spent $3.00 on juice. They decided to share the cost. How much did Merlin need to pay Basil so that they each spent the same amount?

Grade 3 Mactivity023 covers:
M10:demonstrate the relationship between all coins and bills up to $100
M12:read and write money amounts using two forms of notation (89¢ and $0.89)

Measurement
My Temperature Book

In your temperature book, draw the temperature on the thermometer. Afterwards, write down what you would wear at that temperature and draw an activity that you could do.

Grade 3 Mactivity024 covers:
M9:estimate, read, and record temperature to the nearest degree Celsius

Measurement
Hickory Dickory Dock

Basil wants to help you practice telling time. Follow the directions below to create your own special clock.

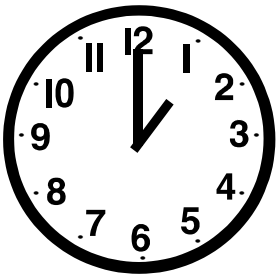
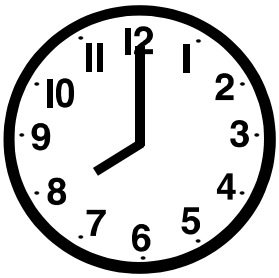
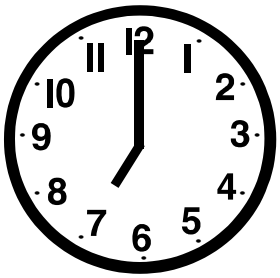
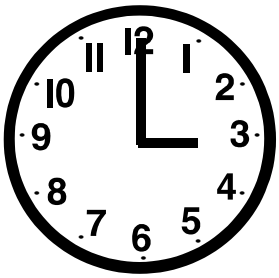
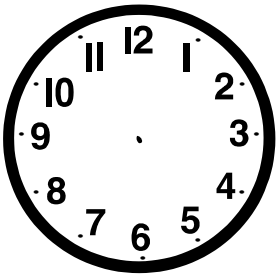
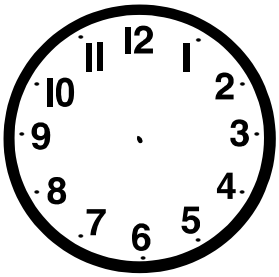
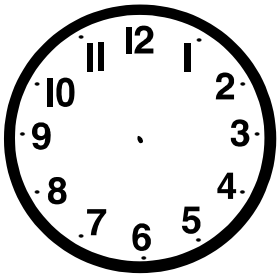
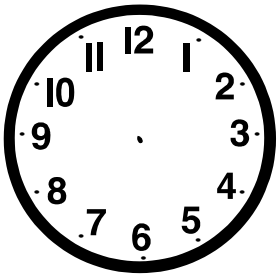
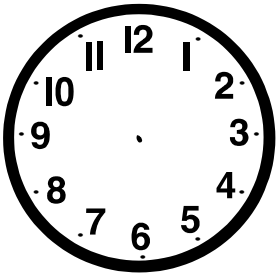
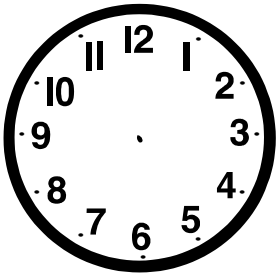
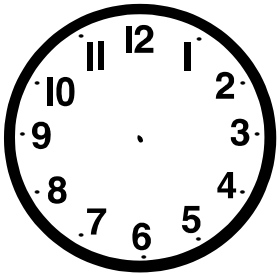
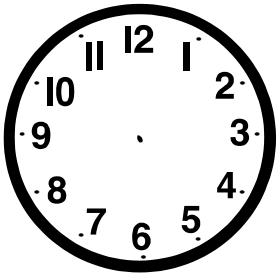
Materials:	Method:
1) the clock cut out 2) scissors 3) hole punch 4) butterfly pin	1) Cut the clock out. 2) Punch holes in the two hands and in the middle of the clock. 3) Attach the hands to the clock using the butterfly pin.

Once you've finished your clock, let's meet at the carpet and read Pigs on a Blanket by Amy Axelrod and Illustrated by Sharon McGinly-Nally.

Grade 3 Mactivity025 covers:
M8:read and write time to the nearest five minutes using analog clocks

Measurement
Telling Time

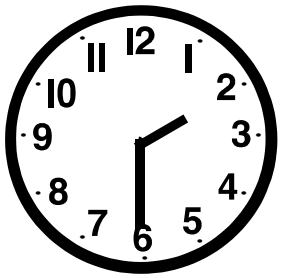
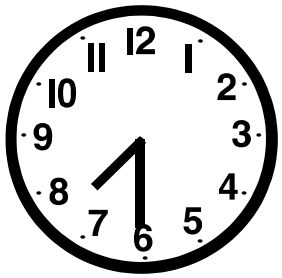
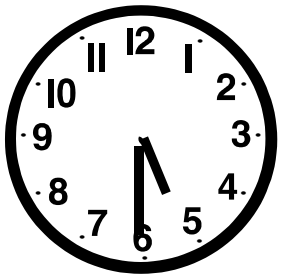
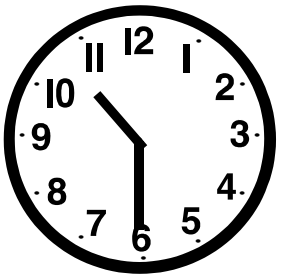
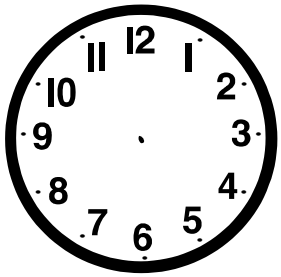
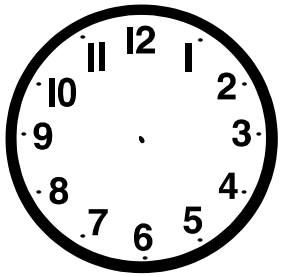
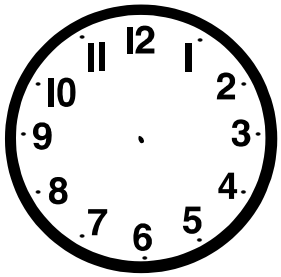
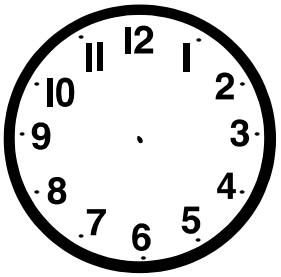
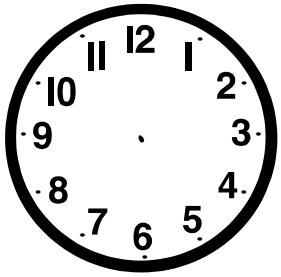
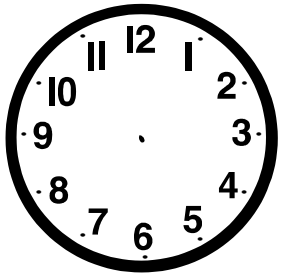
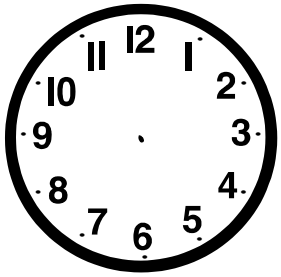
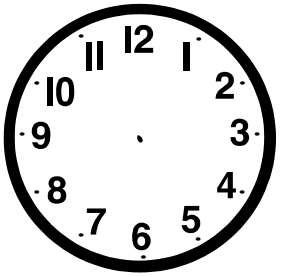
Merlin is a very busy wizard! But he is always late. He needs you to help him tell time so that he is not late for his very important dates!

 _____ : _____	 _____ : _____	 _____ : _____	 _____ : _____
 _____ 4:00	 _____ 11:00	 _____ 2:00	 _____ 6:00
 twelve o'clock _____ : _____	 five o'clock _____ : _____	 nine o'clock _____ : _____	 ten o'clock _____ : _____

Grade 3 Mactivity026 covers:
M7:tell and write time to the nearest minute in 12-hour notation using digital clocks
M8:read and write time to the nearest five minutes using analog clocks

Measurement
Telling Time

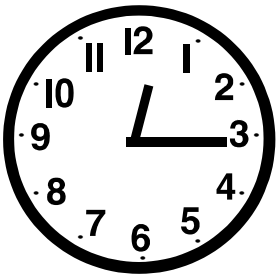
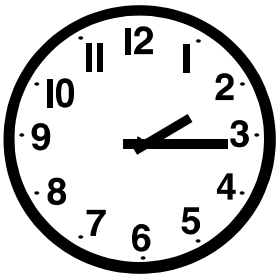
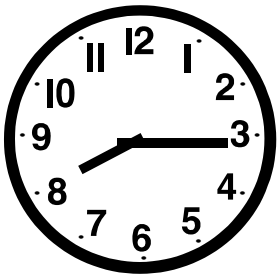
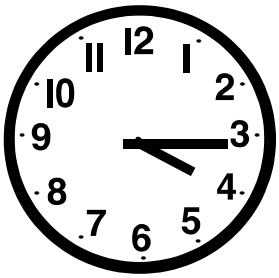
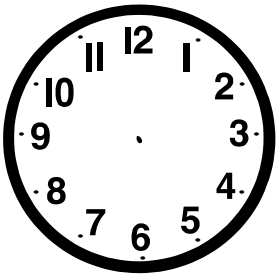
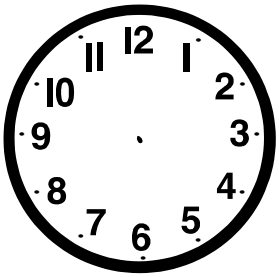
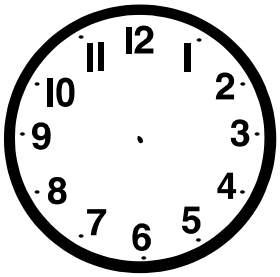
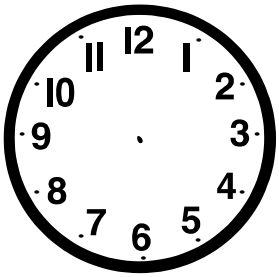
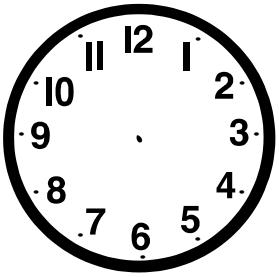
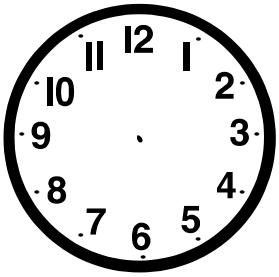
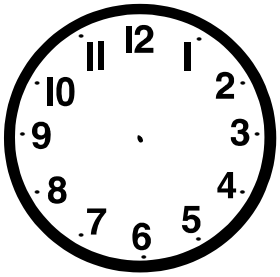
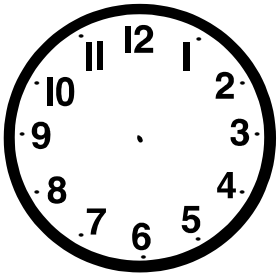
Merlin is a very busy wizard! But he is always late. He needs you to help him tell time so that he is not late for his very important dates!

 _____ : _____	 _____ : _____	 _____ : _____	 _____ : _____
 _____ 1:30	 _____ 4:30	 _____ 9:30	 _____ 11:30
 half past eight _____ : _____	 half past six _____ : _____	 half past twelve _____ : _____	 half past three _____ : _____

Grade 3 Mactivity027 covers:
M7:tell and write time to the nearest minute in 12-hour notation using digital clocks
M8:read and write time to the nearest five minutes using analog clocks

Measurement
Telling Time

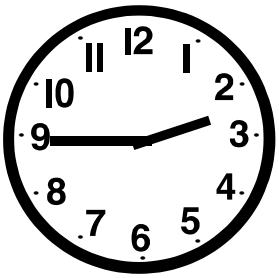
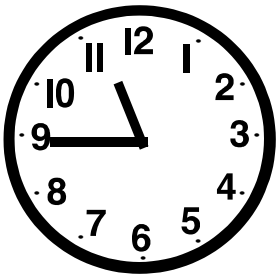
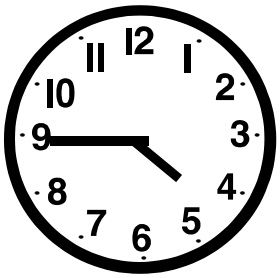
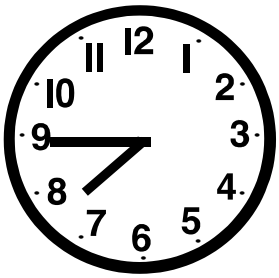
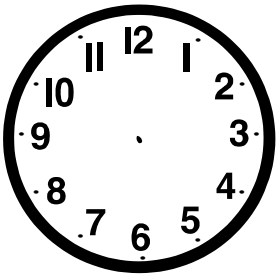
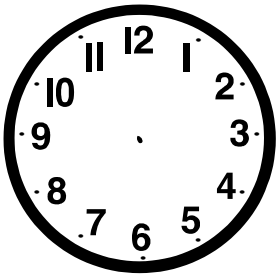
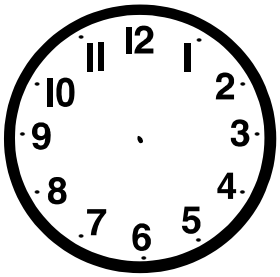
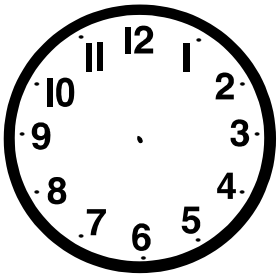
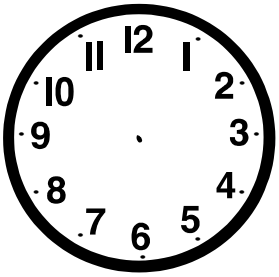
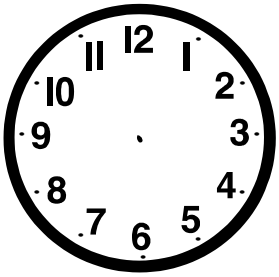
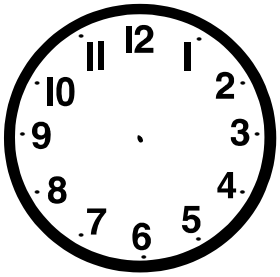
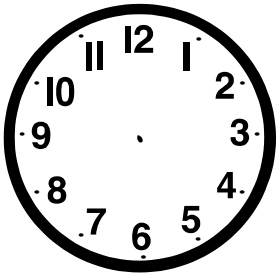
Merlin is a very busy wizard! But he is always late. He needs you to help him tell time so that he is not late for his very important dates!

 _____ : _____	 _____ : _____	 _____ : _____	 _____ : _____
 _____ 5:15	 _____ 1:15	 _____ 7:15	 _____ 9:15
 quarter past six _____ : _____	 quarter past eleven _____ : _____	 quarter past ten _____ : _____	 quarter past three _____ : _____

Grade 3 Mactivity028 covers:
M7:tell and write time to the nearest minute in 12-hour notation using digital clocks
M8:read and write time to the nearest five minutes using analog clocks

Measurement
Telling Time

Merlin is a very busy wizard! But he is always late. He needs you to help him tell time so that he is not late for his very important dates!

 _____ : _____	 _____ : _____	 _____ : _____	 _____ : _____
 8:45	 6:45	 10:45	 1:45
 quarter to ten _____ : _____	 quarter to four _____ : _____	 quarter to six _____ : _____	 quarter to one _____ : _____

Grade 3 Mactivity029 covers:
M7:tell and write time to the nearest minute in 12-hour notation using digital clocks
M8:read and write time to the nearest five minutes using analog clocks

Measurement
How many?

Merlin needs a chart in his math book to help remind him how many seconds there are in one minute and how many months are in one year. Help Merlin fill in the chart and glue it in your math book.

How many seconds in one minute?	
How many minutes in one hour?	
How many hours in one day?	
How many days in one week?	
How many days in one month?	
How many days in one year?	
How many weeks in one year?	
How many months in one year?	

Merlin has a Problem!

Merlin decided he wanted to run like Donovan Bailey, so, he started practising running around the track. The first day it took him 54 seconds. Each day after that, it took him 4 fewer seconds than the day before. What is the difference between Merlin's times on Day 1 and Day 5?

Grade 3 Mactivity030 covers:
M5:demonstrate an understand of the relationship between days and years, weeks and years.

Measurement
My Timetable

As a class, let's read the book The Grouchy Ladybug by Eric Carle.

Today, we are going to make a timetable book. On each page, write the time down using an analog clock and a digital clock for each activity you do during the day. Draw a picture of what you look like doing that activity.

Grade 3 Mactivity031 covers:
M7:tell and write time to the nearest minute in 12-hour notation using digital clocks
M8:read and write time to the nearest five minutes using analog clocks.