

Survive Math Five

Problem Solving



Problem Solving

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Table of Contents

Introduction	v
Lessons	1
Lesson 1: Developing a Problem Solving Plan	1
Lesson 2: Finding Facts and Placing Numbers in Problem Statements	5
Lesson 3: Choosing the Correct Operation	9
Lesson 4: Clarifying the Problem	13
Lesson 5: Too Many or Too Few Facts in Problems	19
Lesson 6: Eliminating Possibilities	23
Lesson 7: Using “Guess and Test” Techniques	27
Lesson 8: Estimating Answers to Problems	31
Lesson 9: Problem Solving: Diagrams	35
Lesson 10: Looking for Patterns	39
Lesson 11: Problem Solving: Organizing Data	45
Lesson 12: Multi-step Problems	51
Lesson 13: Logical Thinking	55
Lesson 14: Problems: Mass and Capacity	61
Lesson 15: Problems: Time and Temperature	65
Lesson 16: Problems Using Vertical and Horizontal Number Lines	71
Lesson 17: Puzzle Problems	77
Mastery Test	81
Lesson Practice Sheets	93
Games	169
Answer Key	177



Survive Math Five

The intent of this program is to assist you, the parent, in working with your child to develop a strong mathematical base of knowledge and to develop mathematic literacy.

Many children arrive in Grade Five lacking, or are weak in, basic mathematic concepts and operations. Children need the freedom to explore and to develop reasoning and mathematic skills, and to be able to show and explain these skills to others. Also, children should understand that mathematics is not just simple rules; it should make sense, be logical, and enjoyable.

To be successful in mathematics children must understand the “how” and “why” of each operation. A child’s ability to reason is as valuable as her or his ability to find the correct answers.

It is important for children to use “manipulatives” (concrete objects) to explore, develop, and apply mathematical concepts. Before children are allowed to use a calculator as a tool they should learn and understand the basic facts.

The activities in this program are designed to engage your child’s interest, develop a number sense, and learn the basic operations and concepts for:

- addition and subtraction
- multiplication and division
- fractions and decimals
- problem solving

At the completion of this program your child should be able to use the number operations appropriately and effectively.

In this package you will find:

- Twenty-minute lessons and ideas for review
- Mastery Test
- Practice Sheets
- Games
- Answer Key

In this package there is also a selection of **Teaching Aids** that are to be used with selected lessons.

Practice Sheets

Each practice sheet contains the following sections:

- Warm-Up
- It's Your Turn

All of the activities in each section are short and, we hope, enjoyable.

Problem solving is the cornerstone of mathematics instruction. Your child must learn effective problem solving skills that include the ability to communicate solutions, so that she or he will become a reasoning, thinking person.

Problem solving requires mathematical thinking that should come naturally from day-to-day experiences. Your child should be able to explore, create, adjust to changes, and actively acquire new knowledge throughout her or his life.

Reading problems requires good vocabulary and comprehension skills. If your child is weak in these areas, read the problems with her or him.

It is important that your child understands the concept or skill covered in each lesson before you move to the next one. If your child has difficulty with any concept or skill, you will need to give her or him additional concrete “hands-on” experiences and practice. Use the information in the package as a guide if you need to develop further practice materials.

When your child has a good understanding of the concept or skill taught in any given lesson, proceed to the next lesson. There is little value in asking your child to do additional work on something she or he already knows.

Additional materials needed for many lessons:

- Ruler to use as a number line
- Playing cards
- Calculator
- Access to a computer

Mathematics concepts are easier to understand if your child progresses from the **concrete**, to the **pictorial**, to **numerals**.

It is important to provide your child with a selection of concrete materials.

For example, you could use buttons, straws, pasta pieces.

There is an old Chinese proverb that says:

*I hear and I forget
I see and I remember
I do and I understand*

Math Web Sites

If any of the following Web sites are not working, use a search engine such as Google to find other appropriate sites.

Steps to problem solving

<http://teacher.scholastic.com/lessonrepro/lessonplans/steppro.htm>

<http://mathforum.org/dr.math/faq/faq.word.problems.html>

Word problems

<http://www.syvum.com/math/wordproblems/level2.html>

<http://www.dupagechildrensmuseum.org/aunty/chmain.html>

<http://www.stfx.ca/special/mathproblems/grade5.html>

<http://library.thinkquest.org/4471/>

<http://mathforum.org/pow/> click on “Math Fundamentals”

<http://math.about.com/od/1/>

<http://www.rhlschool.com/math.htm>

<http://worksheets.teach-nology.com/math/word/> go to Word

Problems Worksheets/Printables

<http://www.manatee.k12.fl.us/sites/elementary/palmasola/>

wordprobsindex.htm

<http://www.edhelper.com/WordStories.htm>

Brain teasers

<http://www.eduplace.com/math/brain/>

<http://www.eduplace.com/kids/mhm/index.html>

Lesson 1

Developing a Problem Solving Plan



What You Need

- Practice sheets
- Teaching Aids
Math Function Chart



Warm-Up

Take out the Lesson 1 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

In this lesson your child has a chance to try two things:

- define a problem
- make different plans to solve a problem

At the end of this lesson, tear out the Problem Solving Math Function Chart from the Teaching Aids section. Have your child refer to this chart whenever she or he is working on problem solving activities.

Parent Script:

Planning how to do things, being organized in carrying out a plan, and showing the work you do, are important things to remember when you are trying to solve a problem. There are many ways in which to solve a problem. You will find that some ways prove to be more effective than others.

These four steps can help you solve many problems.

- understand the problem
- make a plan
- try the plan
- look back

Let's begin by looking this particular problem.

Jack delivers flyers for the grocery store. At school he plays on the basketball team. The team has a game after school.

Jack's problem is that he must deliver his flyers before 5:00 and his game is not over until 4:30. It takes him 1 hour and 15 minutes to deliver all the flyers.

Jack decided that he couldn't play. His team was disappointed because he was a valuable member of the team.

Jack did not try very hard to solve his problem.

What was Jack's problem? If you were Jack, how would you solve his problem?

Here is a plan for solving Jack's problem.

Think:

Jack couldn't be in two places at the same time.

What could Jack do to solve his problem?

Plan:

Jack could have planned ahead and asked a friend, brother, or sister to deliver his flyers.

Perhaps, Jack could have delivered the flyers before school or at lunchtime.

Maybe Jack could have played half the game and then delivered his flyers.

Look Back:

Was Jack satisfied with what he had done?

Did Jack look at all the possible solutions?

Which was the best solution to Jack's problem?

Next time Jack would be better prepared for the situation if he:

Identified the problem:

I have two things that I must do at the same time.

Planned ahead:

Jack trained his brother, Joe, so he could deliver the flyers.

Thought about his plan:

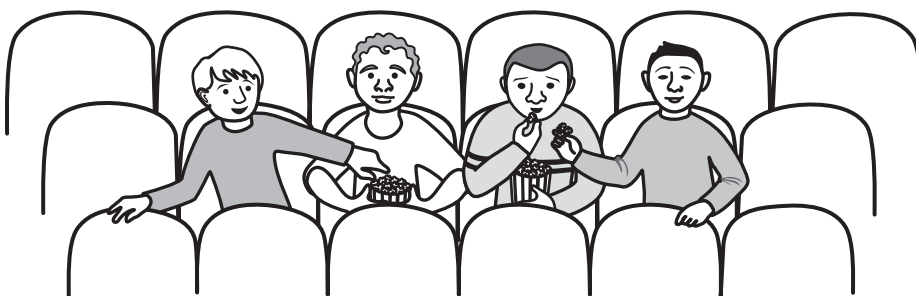
Does the solution make sense?

Yes, Jack is able to play the game and his brother is happy to make some extra money

Looked back:

Jack's solution to the problem was excellent. It made he and his brother happy.

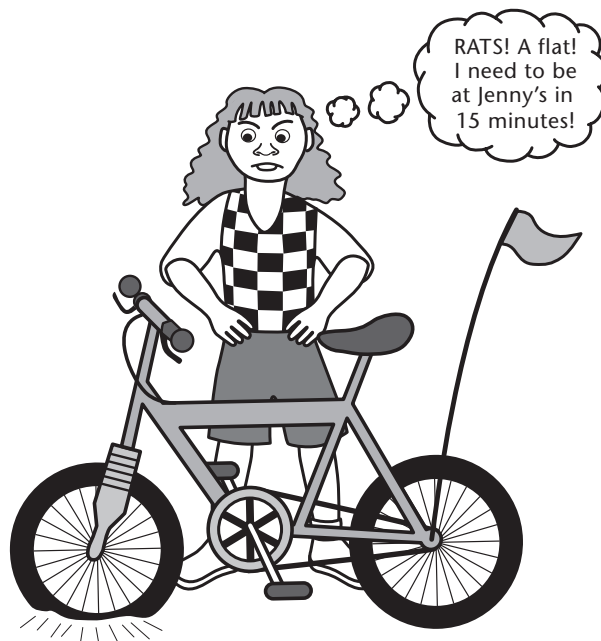
Work with your child to solve this problem.



Ask your child the following questions.

- What is the problem? (*There are 3 bags of popcorn and 4 boys.*)
- What two plans might solve this problem? (*Answer Ideas: Ask for an extra bag and divide the popcorn evenly between the four bags. Buy something else everyone may not like popcorn.*)

Now help your child to work on a plan to solve the following problem.



What is Sarah's problem? *(She needs to be at Jenny's in 15 minutes and her bicycle has a flat tire.)*

What could she do about it? Identify four plans. *(There are many possible answers, here are four examples: get a ride by car; change the tire; go by bus; borrow a bike.)*

When your child has solved the problem, ask:

- What four plans did you identify?
- What plan did you think was the most reasonable? Why?



It's Your Turn

Have your child look at the Lesson Practice sheet for Lesson 1. To make sure your child understands the activity directions, help her or him to complete the first question. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. The Answer Key is at the back of this book. Help your child to complete any needed corrections.

Lesson 2

Finding Facts and Placing Numbers in Problem Statements



What You Need

- Practice sheets



Warm-Up

Take out the Lesson 2 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

Parent Script:

In order to solve problems you have to have information. Some information can be in the form of words, while some information can be in the form of numbers.

Let's begin this lesson by looking for facts or information in a problem statement.

This is a letter that Lucy wrote to her grandmother. Part of Lucy's letter included some facts (information) about a recent trip. Let's read what she says.

"I went on a trip with my friends, Jackie, Marie, Helen, and Samantha. We traveled by ferry from Victoria to Vancouver. Then we boarded a train for Calgary. The train trip took 16 hours because Calgary was almost 900 km away. The train left Vancouver at 8 o'clock at night. After staying 4 days in Calgary, we took a jet to Winnipeg. We stayed in Winnipeg for 6 days, then we flew back home to Victoria."

There are many questions that could be asked using the facts in the letter.

Here are some question examples. Read and answer each of the questions.

- How many girls went on the trip? (5)
- What were the girls' names? (*Lucy, Jackie, Marie, Helen, and Samantha*)
- Where did the train trip begin? (*Vancouver*)
- What time did the train arrive in Calgary? (*12 noon—not considering the time change*)
- How long was the total trip? (*11 days*)

What other questions can you ask using the facts in the letter?

(expect your child to provide 2 or 3 more questions)

Good work. Now we are going to look at a problem that has blank spaces where numbers should be. We need to place the numbers in the problem in a way so that the problem makes sense.

These are the numbers that need to be placed in the problem.

Tickets:	\$2
All Parents:	2500
Parents who went each night:	150
Nights for the play:	3
Admission total:	\$900

Now for the problem!

The school drama class put on a play for parents. Tickets to the play were \$____. There were ____ parents in the community but only ____ parents attended each evening. The drama class held the play for ____ nights. The gym was full each night so \$____ was taken in for admission.

Putting the numbers in the correct place was easy. Now you can work on a couple of activities by yourself.

**It's Your Turn**

Have your child look at the Lesson 2 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 3

Choosing the Correct Operation



What You Need

- Practice sheets
- Teaching Aids
Math Function Chart



Warm-Up

Take out the Lesson 3 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

The language of problems is very important and often causes more difficulty than the mathematics. There are only four mathematical functions that can be applied to solve problems. The four key functions are addition, subtraction, multiplication, and division. Some words are often used in problems to mean one or the other of the four basic mathematical functions. The Mathematics Function Chart is a useful aid to have available for your child to refer to when needed. You will find it in the Teaching Aids section.

As your child works through this and subsequent lessons, assist her or him to read any difficult vocabulary.

Parent Script:

Some problems give hints as to how they can be solved. **Key words** can help you to analyze a question and choose the correct operation to solve a problem.

For instance, the phrase ***what is the difference*** would give you a hint that subtraction would be used to solve a problem. Let's have a look at some problems to identify what operations to use to solve them.

Read the first problem to me.

Harry and Marcy played a game of Monopoly. When the game was over Harry had \$8000, while Marcy had \$10 500.

The facts from this problem can provide several number questions. Here are two of them.

Question 1: How much more money did Marcy win than Harry?

Key words such as <i>how much more</i>	\$10 500
often mean you should subtract.	$- 8\ 000$
	\$2 500

Marcy had \$2500 more than Harry.

Question 2: What was the total amount of money won by both players?

Key words such as <i>total amount</i>	\$10 500
mean you should add.	$+ 8\ 000$
	\$18 500

The two players won \$18 500 in Monopoly money.

Now let's look at a second problem. Read the problem to me.

Four dogs ate 8 kg of dog food on the weekend.
Dog food sells for \$1.95 per kg.

The facts in this problem can provide at least two number questions.

Question 1: If the dog food was shared equally by the dogs, how much did each dog eat?

The key word <i>shared</i> often means you should divide to find the answer.	$8 \div 4 = 2$
--	----------------

The dogs each ate 2 kg of dog food on the weekend.

Question 2: How much did the dog food cost?

The key information is \$1.95 per kg	\$1.95
and 8 kg were used. This suggests	$\times 8$
multiplication.	
	\$15.60

The cost of the dog food was \$15.60.

Now it's your turn to decide what operations should be used to solve some problems.



It's Your Turn

Have your child look at the Lesson 3 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 4

Clarifying the Problem



What You Need

- Practice sheets
- Teaching Aids
 - Handful of stones, dried beans, or other small objects
 - A variety of sizes of small containers
 - Math Function Chart
 - Ruler
 - Sheet of paper



Warm-Up

Take out the Lesson 4 Practice sheet and ask your child to complete the Warm-Up activity. Answers for this activity will depend on the objects and containers your child uses. The aim is to increase their accuracy in estimating.



Exploring the Topic

Sometimes it is hard to figure out what a problem is really saying since there may be extra words in it, or it may be worded in a way that is different. In today's lesson you will help your child develop strategies to make problem solving easier.

Parent Script:

In the last lesson, you learned that key words help you analyze a question and then choose the correct operation to solve a problem. There are other things you can do to make things easier for you to solve problems.

When you read something you must thoroughly understand, one thing you can do is to underline or highlight the important parts or words.

Another thing you can do is to break a problem or section of reading into smaller parts. It's easier to understand little bits of something than it is to understand the whole thing right away.

Let's try using these ideas to solve some sample problems to see how this can be done. We'll read the first problem together.

Problem: The seating capacity of the bleachers on the field at the high school is 180, in six equal rows. How many people can sit in the first two rows?

Solution: One way to solve this problem is to start by finding all the important information. An easy way to mark this is to underline the key words.

Let's look at the problem now. You'll see that all of the information you need to solve the problem is underlined.

The seating capacity of the bleachers on the field at the high school is 180 in six equal rows. How many people can sit in the first two rows?

Now that you can see the important ideas you can write number sentences to show this information in a way you can use it.

Total number of seats = 180

Number of equal rows = 6

Number of seats in each row = 30
(180 divided by 6)

Number of seats in the first two rows = 60
(2 times 30)

60 people can sit in the first two rows.

Underlining important information is a good strategy to remember. Now we'll look at a second strategy that will help you solve problems. Let's read the problem together.

Problem: Chuck has one hundred twenty-seven hockey cards in his collection. He has forty-eight more cards that are duplicates. He gave away ten of his duplicate cards to Jim and traded fifteen other duplicates to get ten new cards. How many cards does Chuck now have altogether?

Solution: Break the problem up into smaller parts. One way to do this is to ask smaller questions. Using this problem we could ask:

- How many cards does Chuck have at the start?
- How many cards does he give away?
- How many cards does he add to his collection?
- How many cards does he have after all the changes have been made?



You can answer each of the questions by using number sentences. That way the information is easier to understand and you can then solve the problem.

Number of cards in Chuck's collection = 127

Number of duplicate cards = 48

Number of cards he has altogether at the beginning
 $= (127 + 48) = 175$

Number of cards he give to Jim = 10

Number of cards he gave away in trade = 15

Total number of cards he gave away =
 $(10 + 15) = 25$

Number of cards in his collection after giving cards
away $= (175 - 25) = 150$

Number of cards he added to his collection from the trade = 10

Number of cards in his collection now =
 $(150 + 10) = 160$

Chuck now has 160 cards in his collection.

Now that you have seen how to read a problem and find the key words, or break the problem into smaller parts, it's time for us to solve a couple of example problems.

Read this problem to me.

1. There were nine goats, three sheep, four pigs, eight llamas, two ponies, and seven geese in the petting zoo. In the spring three kids, two lambs, six piglets, and twelve goslings were born. During the summer four goats and four pigs were given away to other petting zoos and five geese left the zoo on their own. How many animals were left at the end of the summer?

Underline what you think are the key words or parts.

(Underlined parts:

there were nine goats, three sheep, four pigs, eight llamas, two ponies, seven geese

three kids, two lambs, six piglets, twelve goslings were born

four goats and four pigs given away

five geese left

How many animals were left)

Good work. Now on a piece of paper, write the number sentences you need to solve the problem.

*(Number of animals in the petting zoo =
 $(9 + 3 + 4 + 8 + 2 + 7) = 33$*

*Number of animals born in the spring =
 $(3 + 2 + 6 + 12) = 23$*

*Total number of animals in the spring =
 $(33 + 23) = 56$*

Number of animals given away = $(4 + 4) = 8$

Number of animals who left on their own = 5

*Total number of animals who left the zoo =
 $(8 + 5) = 13$*

*Number of animals left at the end of the summer =
 $(56 - 13) = 43$*

43 animals were left at the end of the summer.)

Nice work! Now let's work on one final example.

2. There are twenty-six sparrows sitting around the bird feeder when a cat comes along and scares the birds away. Once the cat leaves, seventeen sparrows return and fourteen finches and six thrushes join them. How many sparrows did not return to the feeder and how many birds did come to the feeder after the cat left?

Underlining the key words is a good decision. See if you can find and underline all the important words in the problem.

(Underlined parts:

there are twenty-six sparrows

seventeen sparrows return

fourteen finches and six thrushes join them

how many sparrows did not return

how many birds did come to the feeder after the cat left)

Way to go! Now write the number sentences you need in order to solve the problem on the sheet of paper.

*(Number of sparrows that did not return =
 $(26 - 17) = 9$*

*Number of birds that returned to the feeder =
 $(14 + 6 + 17) = 37$*

9 sparrows did not return to the feeder

37 birds did return to the feeder after the cat left.)

Now that you've had some practice solving difficult problems it's time for you to work independently.

**It's Your Turn**

Have your child look at the Lesson 4 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 5

Too Many or Too Few Facts in Problems



What You Need

- Practice sheets
 - Teaching Aids
- Math Function Chart



Warm-Up

Take out the Lesson 5 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

Sometimes a problem does not contain all of the information that is needed. Sometimes a problem has several parts and one part has to be solved before another part can be solved. Although problems with missing facts are not common in Mathematics lessons, your child may face problems like these in everyday life.

Parent Script:

Some problems are made more difficult to solve because there is a great deal of information contained in the problem. It is the problem-solver's job to sort through the information and decide which facts are needed to solve the problem.

On the other hand, sometimes people are asked to solve problems that cannot be solved because some important information has either been left out or is not known.

We are going to look at problems that have too much or not enough information. Read the first problem aloud.

Mr. Smith went to the grocery store with \$30. He bought 8 oranges, 2 dozen apples, and 3 tins of cat food. How much change did he receive from \$10 if the groceries came to \$7.25?

Which facts do you need to answer the question?

(He paid with \$10. The bill was \$7.25.)

Which facts aren't needed to answer the question?

(He had \$30. He bought 8 oranges, 2 dozen apples, and 3 cans of cat food.)

The solution is: \$10.00

$$\begin{array}{r} - 7.25 \\ \hline \$2.75 \end{array}$$

The statement is: Mr. Smith received \$2.75 change.

That problem was quite easy to solve so let's look at the next one. Read the problem to me.

John took his friends to the movie on John's birthday.
How much did it cost John if admission was
\$5.50 per person?

What information is missing?

(Answer: the number of friends John invited)

Can you solve the problem? *(No)*

If I add the information that John invited 3 friends to go to the movie with him can you solve the problem? *(Yes)*

You're correct.

The solution would look like this: \$5.50

$$\begin{array}{r} \times 4 \\ \hline \$22.00 \end{array}$$

The statement would be: It cost John \$22.00 for the movie.

This final problem is a little more difficult than the other two. Let's see if you can follow the thinking that might be used to try to solve such a problem.

This is a very wordy problem, so you will have to read it carefully.

John has brought his coin collection to the group to show everyone how many coins he has and what they are like. He has the coins in a fancy leather case that his grandfather bought for him for his last birthday. John has twelve coins from England, seven coins from France, nine coins from Germany, twenty-six coins from the United States, and forty-eight coins from Canada. How many coins does he have from Europe?

These are some of the key questions you might ask yourself. See if you can answer them.

What am I asked to find out? (*Answer: the total number of coins from England, France, and Germany*)

What do I need to know in order to find out what I'm asked for? (*Answer: the number of coins from England, France, and Germany*)

What information am I given in the question? As you look for this information, underline the key words. (*Answer: John has twelve coins from England, seven coins from France, and nine coins from Germany.*)

What information from the problem is not necessary to answer the question? (*Answer: John has brought his coin collection to the group to show everyone how many coins he has and what they are like. He has the coins in a fancy leather case that his grandfather bought for him for his last birthday.*)

Now you can answer the problem question by putting the important information into number sentences.

For example:

- Number of coins from England = 12
- Number of coins from France = 7
- Number of coins from Germany = 9

- Total number of coins from Europe = $(12 + 7 + 9) = 28$

Statement: John has 28 coins from Europe.

Now it's time for you to apply what you have learned in the lesson.



It's Your Turn

Have your child look at the Lesson 5 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 6

Eliminating Possibilities



What You Need

- Practice sheets



Warm-Up

Take out the Lesson 6 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

This problem-solving strategy is one that your child should enjoy.

Parent Script:

Today's lesson is lots of fun. In it you learn to eliminate possible answers until you only have one answer left. It's similar to detective work, when a detective has a number of suspects. One by one the detective narrows down the suspects and then concentrates on only a few suspects. This is much like what you will be doing today.

Let's begin. Read this problem aloud.

Gillian asked her Uncle Roger how old he was. He said he would give her 3 clues and see if she could guess his age. Uncle Roger advised Gillian to write out all the possible answers and then eliminate answers that did not fit.

Clue #1:

I'm between 19 and 30!

On a sheet of paper, list the possibilities from this clue.

(Answer: 20, 21, 22, 23, 24 25, 26, 27, 28, 29)

Clue #2:

I'm a multiple of 3! Cross off those numbers that are not multiples of 3.

Multiples of 3
21, 24, 27, 30

(Answer: $\begin{array}{ccccc} \cancel{20} & 21 & \cancel{22} & \cancel{23} & 24 \\ \cancel{25} & \cancel{26} & 27 & \cancel{28} & \cancel{29} \end{array}$)

Clue #3:

I'm an even number! Cross out the odd numbers—21 and 27.

(Answer: $\begin{array}{ccccc} \cancel{20} & \cancel{21} & \cancel{22} & \cancel{23} & 24 \\ \cancel{25} & \cancel{26} & \cancel{27} & \cancel{28} & \cancel{29} \end{array}$)

Therefore, Uncle Roger must be 24 years old.

That was quite easy. Now, let's try one more problem. We will go through the steps together. Read the directions.

Use the digits 3, 4, 5, 6 to make 2 addition problems that will have a sum greater than 100.

$$\begin{array}{r} \square \square \\ + \square \square \\ \hline \square \square \square \end{array}$$

Think: Which numbers can't be used in the tens' place?

Try the 3 and 4. Will they work?

$$\begin{array}{r} 3 \square \\ + 4 \square \\ \hline 70\text{s or } 80\text{s} \end{array}$$

No, they can't be used because the sum will only be in the 70s or 80s.

Try 5 and 6 in the tens' column.

$$\begin{array}{r} \boxed{6} \boxed{4} \\ + \boxed{5} \boxed{3} \\ \hline \boxed{1} \boxed{1} \boxed{7} \end{array} \quad \text{or} \quad \begin{array}{r} \boxed{5} \boxed{4} \\ + \boxed{6} \boxed{3} \\ \hline \boxed{1} \boxed{1} \boxed{7} \end{array}$$

Is your answer greater than 100? (Yes.)

It is not important which number is on top in this type of question. Both $64 + 53 = 117$ and $53 + 64 = 117$ are correct.



It's Your Turn

Have your child look at the Lesson 6 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 7

Using “Guess and Test” Techniques



What You Need

- Practice sheets



Warm-Up

Take out the Lesson 7 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

Mathematics is a very precise subject, but there are times when it is important to be able to guess at an answer. Being able to guess fairly accurately helps you to see when an obvious error is made. It takes practice to be able to guess accurately so this is the basis of today's lesson.

Parent Script:

An effective way to solve problems is to make a guess, test your guess, and then repeat the process until you arrive at an answer. In a way, this is similar to last day's lesson where you eliminated possibilities.

You will learn that the way you organize your work is the most important part of this process. Pay attention to the examples we work with today, and you'll see how reasonable guesses can be adjusted or changed until you find an answer to some kinds of word problems.

Let's begin. Read the first problem aloud before we work through the steps to solve it.

Jill has 8 coins in her purse; some are nickels and some are dimes. If Jill has 50¢, how many dimes does she have?

First you make a guess and then you test it. Let's guess that Jill has 4 of each coin.

Set your test up in a table:

	Number of dimes	Value	Number of nickels	Value	Total
Guess 1:	4	40¢	4	20¢	60¢
No—this is too much. Try again with fewer dimes.					
Guess 2:	1	10¢	7	35¢	45¢
Much closer. Let's try with 1 more dime.					
Guess 3:	2	20¢	6	30¢	50¢

Perfect!

Remember the total number of coins had to be 8, so every time you took away a dime you had to add a nickel.

Let's try another problem.

The sum of 2 numbers is 16 and the product of these same numbers is 63. What are the numbers?

Sum means +
Product means $\times$

Think which numbers add up to 16.

Guess 1: $1 + 15$

$2 + 14$

$3 + 13$

$4 + 12$

$5 + 11$

$6 + 10$

$7 + 9$

$8 + 8$

Guess 2: Which of these sets of numbers has a product of 63?



Therefore, the two numbers must be 7 and 9.

Check the answer:

Sum: $7 + 9 = 16$

Product $7 \times 9 = 63$

Now you are ready to try “guess and test” by yourself.



It's Your Turn

Have your child look at the Lesson 7 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 8

Estimating Answers to Problems



What You Need

- Practice sheets



Warm-Up

Take out the Lesson 8 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child. The Answer Key is at the back of this book.



Exploring the Topic

Estimating answers in mathematics is important. It is most important when using a calculator, or solving every day problems that don't need an exact answer.

Parent Script:

When you use a calculator to find a math answer, you must be able to mentally estimate an answer to see if it is reasonable. Sometimes you can push the wrong keys on a calculator, so if you are a good estimator, you will notice if something is wrong with the answer.

Sometimes you just want to know about how much, how many, or a reasonable number close to an actual amount. You can find out by estimating.

Estimating skills include rounding numbers off, and then taking these rounded numbers and completing the operation (+, -, $\times$, $\div$).

In this lesson you will use common sense and estimation to decide reasonable answers.

We'll work through a few sample problems together before you begin independent practice.

Read the first problem.

Wayne Gretzky scored 215 points in an 80-game schedule.

Which of these averages is right?

26.9 269 2.69

- X 269 points per game is impossible.
- X 26.9 points per game is also too high.
- ✓ 2.69 points for each game is reasonable because if he scored 3 points per game he would have $80 \times 3 = 240$.

$$2.69 \text{ points} \times 80 = 215$$

Now you answer the following problem. Remember that the answer should be reasonable.

How much does a pair of running shoes cost?

\$6 \$60 \$600

(Answer: \$60 is reasonable—\$6 is too low and \$600 is too high)

Estimating answers is a useful tool to determine if an answer is reasonable.

The next pair of sample problems use rounding to find easier numbers to estimate a reasonable answer.

Read this problem with me.

There were 307 students at David Cameron Elementary. Each student brought in an average of 4.90 for a fundraiser. About how much money was raised?

Estimate: 307 students becomes 300 students.
(rounding to nearest 100)

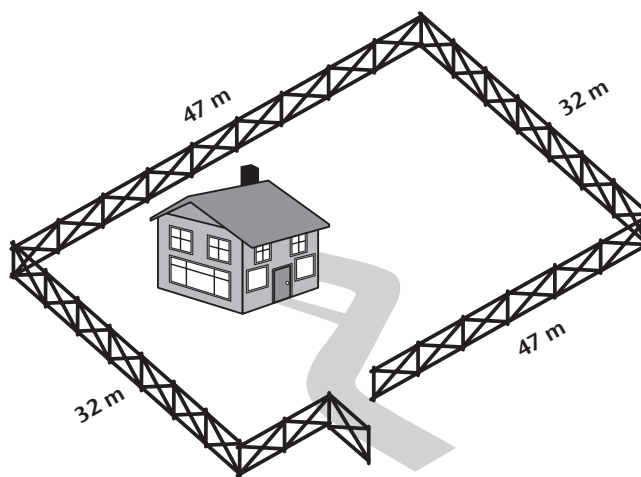
\$4.90 becomes \$5.00 (round to nearest dollar)

Approximately: $300 \times \$5 = \1500

Statement: About \$1500 was raised.

This is the final sample problem. Read the problem and look at the diagram.

What is the approximate perimeter (the distance around) of the field?



Estimate: Round each side to the nearest 10.
 $50 + 50 + 30 + 30 = 160$

Statement: The perimeter is about 160 metres.

Don't forget to write "**about**" in your statement whenever you use estimation.

**It's Your Turn**

Have your child look at the Lesson 8 Practice sheet. Because of the number of questions, you may wish to have your child take two days to complete the activity.

To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 9

Problem Solving: Diagrams



What You Need

- Practice sheets
- Teaching Aids
 - Steps to Solve Problems Chart
 - Sheet of paper or a chalkboard
 - Pencil



Warm-Up

Take out the Lesson 9 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

In today's lesson your child will learn to solve problems by using diagrams to organize information.

Before you begin today's activities, review the steps in problem solving with your child. You will find the Steps to Solve Problems Chart in the Teaching Aids section. Remove the chart and hang it in a convenient place for your child to refer to, when needed.

Parent Script:

Sometimes there is so much information in a problem that it doesn't appear to make sense on the first reading. When this happens, you need to organize **all** of the information. One way you can unravel the information in problem statements is to use diagrams or draw pictures. No matter what you use, remember that you must always **make your plan**, and when the plan is finished ask yourself, "Does this plan make sense?"

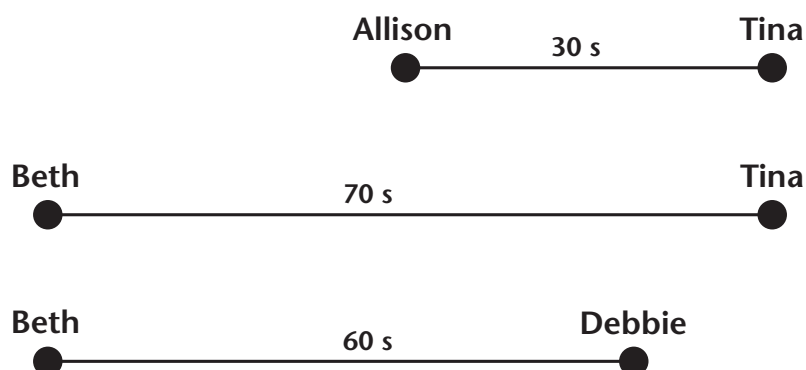
Let's begin by reading this problem.

In a cross-country run, Allison finished 30 seconds behind Tina, who finished 70 seconds ahead of Beth. If Debbie finished 60 seconds ahead of Beth, who won the race?



There are many facts in this problem, aren't there? How do you think you would deal with them? Do you think that drawing a diagram would help you?

Look at this diagram.



Can you tell me now, who won the race? (*Tina won the race.*)

Now, I would like you to read this problem, draw a diagram, and then solve it. Show all of your work and remember to write your sentence statement.

Mr. Able ● Mrs. Able

● ●

● ● ● Their 3 children

[illegible]

37

**It's Your Turn**

Have your child look at the Lesson 9 Practice sheet. If your child needs extra practise drawing diagrams to solve problems, give her or him some more examples before she or he completes the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 10

Looking for Patterns



What You Need

- Practice sheets
- Teaching Aids
 - Sheet of paper or a chalkboard
 - Pencil
 - toothpicks



Warm-Up

Take out the Lesson 10 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

Today's lesson focuses on the use of patterns to solve problems.

Parent Script:

In the last lesson you used diagrams to help you solve problems.

Today you will learn another method you use can to solve difficult problems. It is to look for number patterns. You need to be able to recognize what pattern is used and extend it to find the problem's solution.

When you solve problems it is important to work neatly. Your work also needs to be well organized, so you can easily follow it, and remember what you were thinking. Good problem solvers do not scribble facts all over their paper.

Now let's look at this problem.
Can you work out the pattern?

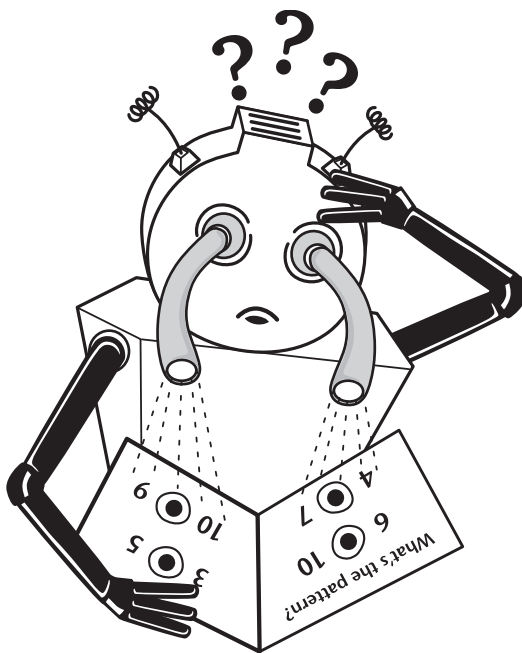
6	●	10	} What's the pattern?
4	●	7	
3	●	5	
10	●	9	

Can you see a pattern?

What is it?

Good! (You added 4 to the first number, 3 to the second number, 2 to the third number, and 1 to the last number.)

Now, I want you to find the pattern and answer these **Martian Math** questions.



☒ means you must double the number and subtract 1.

1. 20 ☒ _____

2. 14 ☒ _____

3. 16 ☒ _____

4. 15 ☒ _____

Correct your child's work.

The answers:

1. 39

2. 27

3. 31

4. 29

Now your child will practice finding patterns in diagrams. Explain to your child that she or he will find out how many toothpicks are needed to make a certain number of triangles. To make solving this problem easier, give your child some toothpicks. If you do not have any toothpicks, ask your child to draw out the triangles and count the lines as she or he draws them.

Parent Script:

How many toothpicks do you think you would need to make 5 triangles?

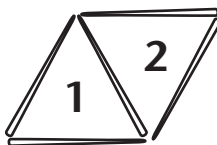
How do you think you can find out?

Right! First, you find out how many toothpicks it takes to make **one** triangle.



How many toothpicks did it take? (3)

Now make **two** triangles. Join the second triangle on to the first triangle. Do not make two separate triangles.



How many toothpicks did it take to make the **two** triangles? (5)

Now make **three** triangles. Remember to join it on to the other two triangles.



How many toothpicks did it take to make the three triangles? (7)

Can you see a pattern? Tell me what it is and I will write it down for you.

3 toothpicks 1 triangle

5 toothpicks 2 triangles

7 toothpicks 3 triangles

Now, use this pattern to find out how many toothpicks are needed to make **four** and **five** triangles.

Give your child time to make the triangles and complete the pattern.

When your child has completed the triangles, she or he should be able to tell you that:

9 toothpicks 4 triangles

11 toothpicks 5 triangles

Now ask your child to use the same pattern to tell you how many toothpicks she or he would need to make **ten** triangles.

When the ten triangles are finished, ask her or him how many toothpicks it took to make them. Twenty-one toothpicks should have been used.

Have your child look at the Lesson 10 Practice sheet. Ask your child to complete the questions independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 11

Problem Solving: Organizing Data



What You Need

- Practice sheets
 - Teaching Aids
- A sheet of paper or a chalkboard



Warm-Up

Take out the Lesson 11 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

This lesson will focus on organizing data using lists and charts as problem solving strategies.

Parent Script:

In the past lessons you learned two strategies that helped you to solve problems.

What were they?

Good! They were diagrams and patterns.

Today you will learn two more strategies that will help you to organize information needed to solve problems. They are **lists** and **charts**.

On a sheet of paper or on the chalkboard draw the following chart. You will use this to solve the next problem.

\$5	\$10	Total
2	1	\$20
4	2	\$40
6	3	\$60
8	4	\$80

As your child works through the problem, write the information she or he gives you on the chart.

Read this problem with your child.

Mr. Jones has twice as many \$5 bills as \$10 bills. He has \$80 in all. How many \$5 bills does Mr. Jones have?

Ask your child how she or he would solve this problem. If your child does not make any suggestions, explain to her or him that the best way to solve the problem would be to make an organized list.

Point to the chart you have on the sheet of paper or on the chalkboard.

Parent Script:

A good way to begin to start this list would be to start with the smallest amount of money.

What is it? (\$5.00)

What do we know about the \$5 bills Mr. Jones has? (*He has twice as many \$5 as \$10 bills.*)

Let's start with 2 \$5 bills.

I will write 2 under the \$5 column.

What will I write under the \$10 column? (*1—I will write 1 because there is one \$10 bill for every 2 \$5 bills.*)

What is the total in dollars? (\$20) ($2 \times \$5 + 1 \times \$10 = \20)

If I put a 2 under the \$10, how many \$5 bills would I have? (4)

Why? (*Because 4 is two times two or twice as many.*)

What would the total be now? (\$40)

What number of \$5 bills do you think I would put under the \$5 column now? (6)

How many \$10 bills would that be? (3)

Can you see a pattern?

What is it? (*In the \$5.00 column you count by 2s.*)

What would the next number of \$5.00 bills be? (8)

How many in the \$10.00 column? (4)

Do all of these numbers add up to \$80.00?

Let's find out.

$$8 \times \$5 = \$40.00$$

$$4 \times \$10 = \$40.00$$

$$\$40.00 + \$40.00 = \$80.00$$

Mr. Jones has 8 \$5 bills.

Now you are going to solve the following problem.

At summer camp Cameron was able to choose what he wanted for dinner. Here is the chart with the choices listed on it.

Meat	Potatoes	Vegetables
Chicken	Mashed	Corn
Hamburger	Baked	Peas
	Fried	

I want you to make a systematic list of all the different dinner possibilities he could have. The first two combinations have been made for you on the following chart. You can complete your work on this chart.

Dinner	Meat	Potatoes	Vegetables
#1	Chicken	Fried	Corn
#2	Chicken	Fried	Peas
#3			
#4			
#5			
#6			
#7			
#8			
#9			
#10			
#11			
#12			

Statement: _____

When you child has completed the list, ask her or him to make a sentence statement about her or his findings.

For example: Cameron was able to choose from ten different dinners.

Cover the answer while your child solves the problem.

Answer:

Dinner	Meat	Potatoes	Vegetables
#1	Chicken	Fried	Corn
#2	Chicken	Fried	Peas
#3	Chicken	Baked	Corn
#4	Chicken	Baked	Peas
#5	Chicken	Mashed	Corn
#6	Chicken	Mashed	Peas
#7	Hamburger	Fried	Corn
#8	Hamburger	Fried	Peas
#9	Hamburger	Baked	Corn
#10	Hamburger	Baked	Peas
#11	Hamburger	Mashed	Corn
#12	Hamburger	Mashed	Peas

If your child has difficulty making lists and chart, have her or him complete this problem. Cover the answer.

List all the 2-digit numbers that can be made from the digits 7, 8, 9. The digits may be used more than once.

9 in the tens	8 in the tens	7 in the tens
97		

Answer:

9 in the tens	8 in the tens	7 in the tens
97	87	77
98	88	78
99	89	79

**It's Your Turn**

Have your child look at the Lesson 11 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 12

Multi-step Problems



What You Need

- Practice sheets



Warm-Up

Take out the Lesson 12 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

Today's lesson will focus on the two or more steps that may need to be completed to solve a problem.

Parent Script:

Sometimes it takes more than one step to solve a problem. You must read all of the problem very carefully and show all of your thinking. You can only do this by showing *all* of your work.

Here is a problem for you to solve.

At a train station, there were **1795** people on the train. At the next stop, **345** people got off and **401** people got on the train. How many people are on the train now?

Give your child a sheet of paper and ask her or him to write down each step of the problem as you work through it.

Parent Script:

You can solve this problem in two steps.

What would be the first step?

The first step is to find out how many people were on the train. (*1795 people*)

How many people got off the train? (*345 people*)

How will you find out how many people are still on the train?

Will you add or subtract? (*Subtract*)

Step 1:

$$\begin{array}{r} 1795 \\ - 345 \\ \hline 1450 \end{array}$$

1450 people are on the train.

How many people got on the train? (*401*)

How will you find out how many people are on the train now?

Will you add or subtract? (*Add*)

Step 2:

$$\begin{array}{r} 1450 \\ + 401 \\ \hline 1851 \end{array}$$

1851 are on the train now.

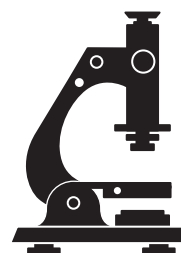
Ask your child to explain why she or he had to **subtract** in Step 1 and **add** in Step 2.

Explain to your child that it is important that her or his work must be neatly completed and all the steps must be shown.

Parent Script:

Now we will read this problem and then you will show me the steps you would take to solve it. Do not forget to write your statement answer.

The new science library purchased 6 new microscopes and 12 sets of microscope slides. The microscopes cost \$225.00 and the slide sets cost \$17.50 each. How much will the new equipment and materials cost?



If your child has difficulty using the three steps to solve the problem, give her or him any required help. When your child has a solution to the problem, her or his work should look the same as this example.

Step 1:

Microscopes

$$\begin{array}{r} 13 \\ \$225.00 \\ \times 6 \\ \hline \$1350.00 \end{array}$$

Step 2:

Slides

$$\begin{array}{r} \$17.50 \\ \times 12 \\ \hline 1 \\ 3500 \\ 17500 \\ \hline \$210.00 \end{array}$$

Step 3:

Total Cost = Slides + Microscopes

$$\begin{array}{r} \$1350.00 \\ + 210.00 \\ \hline \$1560.00 \end{array}$$

If your child requires more practise solving multi-step problems, have her or him solve this one.

John is saving to buy a construction kit that costs \$6.95. He has \$1.04 in his pocket and \$3.25 in his piggybank. How much money does he still need to buy the kit?

Answer:

$$\begin{array}{r} \text{Step 1: } \$1.14 \\ + 3.20 \\ \hline \$4.34 \end{array}$$

$$\begin{array}{r} \text{Step 2: } \$6.95 \\ - 4.34 \\ \hline \$2.61 \end{array}$$

John needs \$2.61 more to buy the construction kit.



It's Your Turn

Have your child look at the Lesson 12 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 13

Logical Thinking



What You Need

- Practice sheets



Warm-Up

Take out the Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



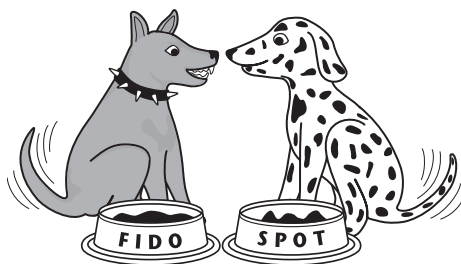
Exploring the Topic

Today your child will be introduced to the use of a matrix—a table that uses checks and crosses to eliminate a number of possible choices.

Parent Script:

Now you are going to learn to use **checks** (✓) and **Xs** (x) to eliminate a number of possible choices. These checks and crosses will be recorded on a table. You may have to read these problems more than once as the information in the middle or at the end may be very important when you begin to solve the problem.

Read this problem with me.



John has 2 dogs, Spot and Fido. One dog likes bacon for breakfast and the other dog eats French toast. Fido never eats bread. What does each dog have for breakfast?

That seems like an easy problem to solve, doesn't it? Learning to set up a table for problems where you use logical thinking will help you when the problems become more difficult. As you read the steps below, notice how the words *if* and *then* are used. You will put in the **Xs** and the **checkmarks** as you read the directions.

	Fido	Spot
French Toast		
Bacon		

Step 1: Clue—Fido never eats bread so French toast is out. Put an X in the box under Fido and beside French Toast.

Step 2: Clue—*If* Fido doesn't eat bread, *then* he must like bacon. Put a checkmark in the box under Fido and beside bacon.

Step 3: Clue—*If* Fido likes bacon, *then* Spot must like French toast since the dogs don't eat the same breakfast.

Step 4: Clue—*If* Spot eats French toast, *then* bacon is not for him.

When your child has completed each step, her or his table should look like this.

	Fido	Spot
French Toast	X	✓
Bacon	✓	X

Parent Script:

By **Step 3** you should have been able to complete the rest of the table.

It is important to remember that whenever you put a checkmark beside or under someone's name, the rest of the row and column must be an **X**. You can put the **Xs** in as soon as you have put in the checkmark.

Ask your child to follow the **four steps** to complete this table to solve the problem.

Shelby liked cereal with fruit for breakfast, while Sally wanted pancakes. Mary doesn't like either of these for breakfast so she has scrambled eggs. What does each child have for breakfast?

	Shelby	Sally	Mary
Cereal and fruit			
Pancakes			
Scrambled eggs			

When your child has completed the table, correct her or his work.

If your child needs further practise, have her or him complete the following table to solve the problem.

Find out which kind of frozen treat each child likes.

Len dislikes fudgesicles
 Lance dislikes creamsicles
 Leon eats popsicles.

	Len	Lance	Leon
Creamsicle			
Fudgesicle			
Popsicle			

Answer:

	Len	Lance	Leon
Creamsicle	✓	X	X
Fudgesicle	X	✓	X
Popsicle	X	X	✓

Working Backwards

Parent Script:

Sometimes, if you work backwards you can solve problems.

If we work backwards how would we solve this problem?

3 rulers and 2 pens cost the same as 4 rulers.

If 1 ruler costs \$3.00, then what does a pen cost?

What is the most important thing we know?

1 ruler costs \$3.00

So what would 4 rulers cost? ($4 \times \$3.00 = \12.00)

If 4 rulers cost \$12.00, how much would 3 rulers cost?
(\$9.00)

To find the cost of 2 pens, you would take the difference between the cost of the 3 rulers from the cost of the 4 rulers.

$$\$12.00 - \$9.00 = \$3.00$$

The difference is the cost of 2 pens. So 2 pens cost \$3.00.

How would you find the cost of 1 pen?

Good! You would divide.

$$\$3.00 \div 2 = \$1.50$$

So 1 pen would cost \$1.50.

To ensure that your child understands this concept, use this graphic to explain the procedure.



\$12.00 ← \$12.00

Make sure your child understands the concept of working backwards to solve a problem before you ask her or him to complete the Practice section.

Now ask your child look at the Lesson 13 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Have your child complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 14

Problems: Mass and Capacity



What You Need

- Practice sheets
 - Teaching Aids
- A sheet of paper



Warm-Up

Take out the Lesson 14 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

This lesson will focus on mass and capacity problems.

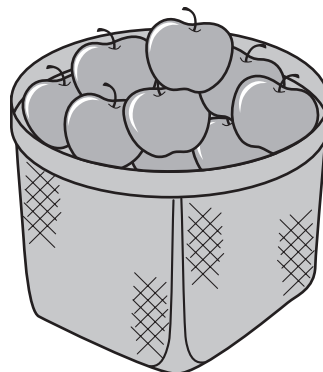
Parent Script:

Today we are going on a shopping trip. It will not be an expensive trip as you won't spend any money. You will have to use your knowledge to make some wise shopping choices. In some activities you will be given two or more choices and you will have to calculate which of the choices will save you the most money. There are many occasions when people have to calculate which choice is the better buy.

So, let's go shopping!

First you will have to find out how much 500 g (grams) of apples would cost.

What operation would you choose to find out the cost?
(multiply)



40¢ / 100 g

Give your child a sheet of paper and ask her or him to find the answer to this problem. When your child has completed the exercise her or his work should be the same as this example.

$$\begin{array}{rcl}
 \$0.40 & \rightarrow & 40\text{¢ per } 100 \text{ g} \\
 \underline{\times \quad 5} & \rightarrow & \text{number of } 100 \text{ g portions in } 500 \text{ g} \\
 \$2.00 & \rightarrow & \text{total cost}
 \end{array}$$

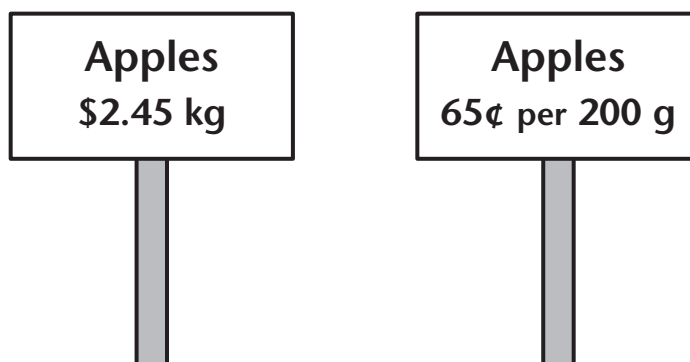
The apples will cost \$2.00.

If your child has difficulty solving this problem, go through each step with her or him.

Parent Script:

Now we are going to another store to compare the cost of apples to see which one is the better buy, \$2.45 for 1 kg (kilogram) or 65¢ for 200 g (grams).

Look at these signs.



Ask your child the following questions.

What do you know? (200 g cost 65¢)

How many 200 g are there in 1000 g or 1 kg? (5)

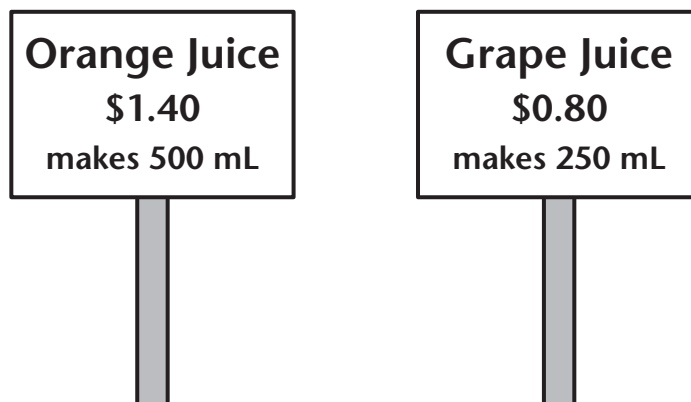
How will you will the answer to the question?
(multiply 65¢ by 5)

65¢ for 200 g
 5 x 65¢ for 1000 g

$$\begin{array}{r} \$0.65 \\ \times \quad 5 \\ \hline \$3.25 \end{array}$$

The apples that cost \$2.45 a kilogram are the better buy.

Ask your child to look at the signs below and find out which is the better buy.



When your child has finished her or his calculations, correct her or his work.

\$1.40 for 500 mL of orange juice
 2 x 250 mL = 500 mL of grape juice
 so 2 x \$0.80 = \$1.60 for 500 mL of grape juice

The answer: Orange juice at \$1.40 for 500 mL is the better buy.

**It's Your Turn**

Have your child look at the Lesson 14 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 15

Problems: Time and Temperature



What You Need

- Practice sheets
- Teaching Aids
 - A sheet of paper
 - A clock



Warm-Up

Take out the Lesson 15 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

Today's lesson will be divided into two parts. **Part A** will focus on temperature. **Part B** will focus on time. You may want to do this lesson in two sessions.

Part A: Temperature

Parent Script:

Working out the answers to time and temperature problems can be fun. First you will learn how to find the *average* daily temperature.

Average Temperature

To find the average daily temperature you **add** up all the temperatures that are shown, and then **divide** by the number of days.

For example: If 3 days of temperatures were shown, you would add all the temperatures and divide by 3.

Let's look at the following example.

Vernon	
Day	Average Temperature
Monday	30°C
Tuesday	19°C
Wednesday	22°C
Thursday	17°C
Friday	28°C
Saturday	19°C
Sunday	26°C

The average is found by adding all 7 temperatures, then dividing by the number of days (7).

Add:

$$\begin{array}{r}
 30^{\circ}\text{C} \\
 19^{\circ}\text{C} \\
 22^{\circ}\text{C} \\
 17^{\circ}\text{C} \\
 28^{\circ}\text{C} \\
 19^{\circ}\text{C} \\
 \hline
 26^{\circ}\text{C} \\
 161^{\circ}\text{C}
 \end{array}$$

Divide:

$$\begin{array}{r}
 23 \\
 7 \overline{)161} \\
 \underline{-14}^x \\
 21 \\
 \underline{-21} \\
 0
 \end{array}$$

The average daily temperature in Vernon was 23°C.

Discuss each of the steps of how to find the average daily temperature with your child.

Mean Temperature

Parent Script:

Now let's find out how you calculate the mean temperature. To do this you must look for the highest temperature and the lowest temperature for the day. When you have found them you **add** the two temperatures together and **divide** by 2.

For example: If the high was 28 degrees C and the low was 16 degrees C, then add $27 + 17 = 44$ degrees C.

Now divide the 44 degrees by 2.

$44 \div 2 = 22$ degrees

The *mean temperature* is 22 degrees C.

Show your child the following example and discuss the steps with her or him.

Kelowna — July 15	
High	Low
34°C	22°C

What was the mean temperature for Kelowna on July 15th?

Add the high and low temperatures.

$$\begin{array}{r} 34^{\circ}\text{C} \\ + 22^{\circ}\text{C} \\ \hline 56^{\circ}\text{C} \end{array}$$

Then divide by 2.

$$\begin{array}{r} 28 \\ 2 \overline{)56} \\ \underline{-4} \\ 16 \\ \underline{-16} \\ 0 \end{array}$$

The mean temperature in Kelowna was 28°C.

Give your child as many examples as she or he needs to calculate the average daily and mean temperatures before completing the Practice sheet for Lesson 15, **Part A**.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections, then return to **Part B** of this lesson.

Part B: Time

Parent Script:

Believe it or not there are such things as a 12-hour clock and a 24-hour clock. As you know, there are twenty-four hours in a day, but the 12-hour clock uses the abbreviations a.m. for times that occur between midnight and noon, and p.m. for times occurring between noon and midnight.

The 24-hour clock does not use a.m or p.m. Instead, the hours of the day are numbered from 0 to 24.

For example: It is 6 o'clock in the morning.

For 12-hour time you would write 6:00 a.m.

For 24-hour time you would write 06:00.

24-hour Clock

0:00 – 12:00

12:00 – 24:00

midnight to noon

noon to midnight

(a.m.)

(p.m.)

To write a p.m. time on the 24-hour clock, you add 12 h, e.g., 3:30 p.m. = 15:30 on the 24-hour clock.

The a.m. times remain the same.

Look at these times and you tell whether the time given on the 24-hour clock is in a.m. or p.m.

14:10

07:00

12:15

17:00

21:30

Give your child as many examples as she or he needs to tell 12-hour and 24-hour times before completing the Practice Lesson for Lesson 15, **Part B**.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 16

Problems Using Vertical and Horizontal Number Lines



What You Need

- Practice sheets
- Teaching Aids
 - Problem Solving Chart
 - Sheet of paper



Warm-Up

Take out the Lesson 16 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

Begin this lesson by reviewing the steps needed to solve problems. Refer your child to the Problem Solving Chart. You will find this chart in the Teaching Aids Section.

Parent Script:

You have looked at many ways that you can solve different types of problems, haven't you? Whenever you have a problem to solve you must always try the steps you read about on the Problem Solving Chart.

Let's try to apply those steps to the following problem to see how it works.

Read the following problem with your child.

In Elizabeth's town there are one hundred and fourteen days of sun, one hundred and twenty-three days of rain and sixty-eight days of snow. If the remainder of the days are just cloudy, how many days in the year are cloudy and how many days have no rain or snow?

Ask your child these key questions and have her or him answer each of them. Your child's answers should be similar to the bulleted statements.

1. **What are you asked to find out?**
 - *The number of cloudy days.*
 - *The number of days with no rain or snow.*
2. **What information have you been given?**
 - *Number of sunny days = 114*
 - *Number of rainy days = 123*
 - *Number of snowy days = 68*
 - *All other days are just cloudy.*
3. **What important information do you need to know that relates to this problem?**
 - *There are 365 days in one year.*
4. **What do you need to know in order to find the answer to the problem?**
 - *I need to know all of the information that has been given and the fact that there are 365 days in a year.*

Ask your child to solve the problem.

Answer:

To find the number of just cloudy day.

$ \begin{array}{r} 11 \\ \text{Step 1: } 114 \text{—sunny} \\ 123 \text{—rainy} \\ + 68 \text{—snowy} \\ \hline 305 \end{array} $	$ \begin{array}{r} 365 \\ \text{Step 2: } \\ - 305 \\ \hline 60 \end{array} $
--	---

There are 60 cloudy days in the year.

To find the number of days without rain or snow.

$$\begin{array}{r} \text{Step 3:} \quad 123 \text{—rainy} \\ + 68 \text{—snowy} \\ \hline 191 \end{array}$$

$$\begin{array}{r} \text{Step 4:} \quad 365 \\ - 191 \\ \hline 174 \end{array}$$

There are 174 days with no rain or snow in the year.

Parent Script:

Today you are going to practise labeling both horizontal and vertical number lines to measure distances or to show order and position.

Not all number lines are numbered 0, 1, 2, 3, and so on.

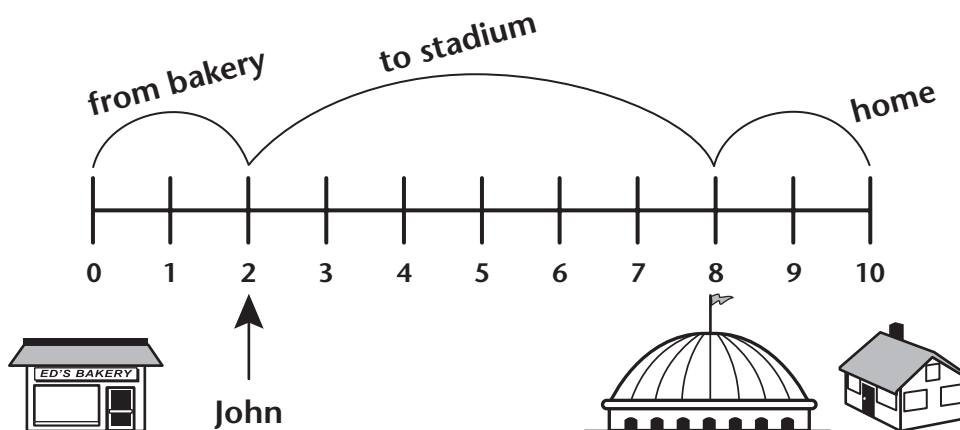
Some lines can represent larger numbers, for example, 0, 10, 20, 50, 100, 200, etc.

Other numbers lines can be in intervals of 1, 2, 5, 10, and so on.

Now let's look at some number lines that will help you to solve problems.

Read this problem with your child.

John was 2 blocks east of the bakery. He went east 6 blocks to the stadium. He watched the football game, then walked 2 more blocks east to his house. How far was John's house from the bakery?



Explain to your child that any problem about land motion is always shown as a horizontal line. Discuss how this number line is divided into intervals of 1. Ask your child how many blocks John's house is from the bakery. (*John's house is 10 blocks from the bakery.*)

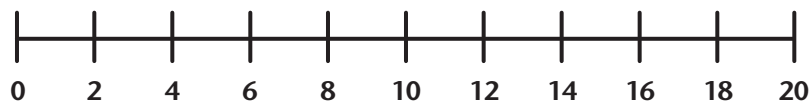
Point to the following number lines. Explain to your child that number lines always start at zero (0) but they can have any number of intervals. The intervals depend on the numbers you are working with.

Number lines start at 0. Number lines can have —

Intervals of 1:



Intervals of 2:



Intervals of 5:



Intervals of 10:

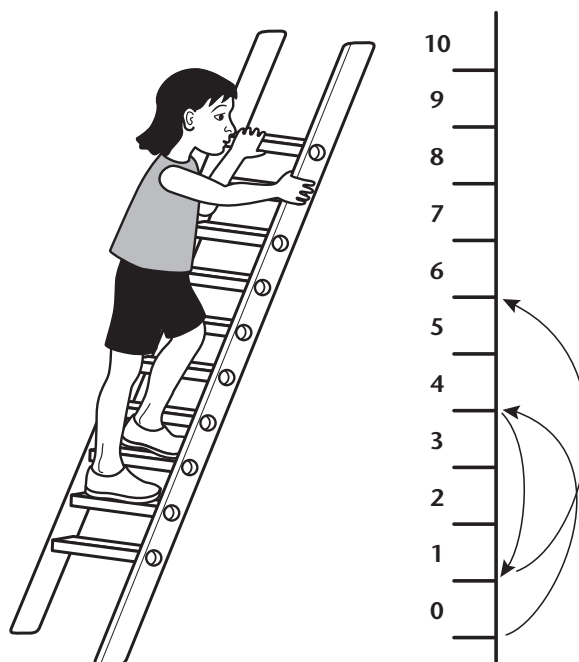


or any other interval size—but each gap must represent the **same** distance.

Parent Script:

Sometimes, you may need to use a number line in a vertical position. Anything that is going up or down, for example, stairs, are usually shown on a vertical number line.

Read this problem to your child and discuss how the vertical number line is used to solve the problem.



Josie climbed up on the ladder, went down 3 rungs, then climbed back up 5 rungs. On what rung of the ladder did Josie end up? (*rung 6*)

**It's Your Turn**

Have your child look at the Lesson 16 Practice sheet. Give your child as many examples as she or needs working with horizontal or vertical number lines before asking her or him to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Lesson 17

Puzzle Problems



What You Need

- Practice sheets
- Teaching Aids
 - Steps to Solve Problems Chart
 - Sheets of paper
 - Coloured pencils



Warm-Up

Take out the Lesson 17 Practice sheet and ask your child to complete the Warm-Up activity. When she or he is finished, correct the work with your child.



Exploring the Topic

In this lesson your child will apply the steps of problem solving to solving puzzles.

Parent Script:

Today you will follow the steps in problem solving to see how they work to solve this puzzle.

The value of the words SUMMER HOLIDAY is 163. If this is true, what is the value of the words WINTER VACATION?

One of the first things you have to do is decide on the method to solve the problem. Think about the different problem solving techniques you have learned.

Do you think it would be a good idea to look for a pattern that may not be easily seen but can be figured out? Maybe you could break the puzzle into smaller pieces to see if that would help.

One way of breaking the problem apart would be to separate the words into small parts or individual letters. Do you think that you could give each letter a number, and when the numbers are added together, the total for the letters in SUMMER HOLIDAY will be 163?

Give your child a sheet of paper. Ask her or him to write out the letters of the alphabet and then give each letter a value number.

For example: $A = 1$ $B = 2$ $C = 3$ $Z = 26$

Now ask your child to write the words SUMMER HOLIDAY on the sheet of paper and give each letter the appropriate number.

For example: $S = 19$ $U = 21$ $M = 13$

When your child has given each letter a number, ask her or him to add up all the numbers. The total of the numbers should equal **163**.

Ask your child to write out the words WINTER VACATION and give each letter the appropriate number.

For example: $W = 23$ $I = 9$ $N = 14$

When your child has given each letter a number, ask her or him to add up all the numbers. The total of the numbers in the words WINTER VACATION should equal **174**.

To complete the exercise ask your child to make a summary statement.

For example, the value of the words WINTER VACATION is greater than the value of the words SUMMER HOLIDAY.

Parent Script:

Here is a problem that you can turn into a puzzle or a magic trick to play on the rest of the family or your friends. This puzzle uses numbers.

Give your child another sheet of paper and ask her or him to write the following grid on it.

A	1	2	3	4
B	5	6	7	8
C	9	10	11	12
D	13	14	15	16

Explain to your child that she or he is to follow your directions to find the answer to this number puzzle.

Parent Script:

- Starting with row **A** chose one number in the row and put a circle around it.
- Now cross out the 3 numbers directly under the circled number.
- Choose a number from row **B** and circle it. You cannot choose a number that has been crossed out.
- Cross out the 2 numbers directly under the circled number in that row.
- Choose a number from row **C** and circle it.
- Cross out the number directly under the circled number.
- Circle the one remaining number in row **D**.
- Add all of the circle numbers together and what is the answer? (34)

Give your child a different coloured pencil and repeat the whole process again. Make sure your child chooses different numbers this time.

When the second set of numbers has been added together, ask your child the following questions.

- What do you find when you add the circled numbers? *(They are in a diagonal line.)*
- How does the sum of the first set of numbers compare with the sum of the second set of numbers? *(The answers are the same.)*
- What is it about the numbers that can make this happen? *(You must always choose 1 number from each row and no chosen number can be directly under the circled number. If you do this the chosen numbers will always add up to 34.)*



It's Your Turn

Have your child look at the Lesson 17 Practice sheet. To make sure your child understands the activity directions, read them with her or him. Now ask your child to complete the rest of the section independently.

When your child has completed this section, correct her or his work. Help your child to complete any needed corrections.

Mastery Test—Problem Solving

Today your child will complete a Mastery Test. The questions on this test will cover the skills and concepts that have been taught in this package. If you feel your child is not ready to take the test, make sure you review any skills or concepts your child may still have difficulty understanding before you administer it. Do not give your child this test unless you are confident he or she can complete it successfully.

Note: Your child will need more than one sitting to complete this test.

Take out the Mastery Test on the following pages and place it in front of your child. Explain to him or her that the test needs to be completed independently. Encourage your child to take a few moments to look over the questions. Ask your child if he or she understands what is expected. Give your child as much time as he or she needs to complete the test. If you see your child having any difficulty answering a question, tell him or her to leave that question and move on to the next one. When your child has completed all of the questions, encourage him or her to look over the work for any errors that may have been made. Mark the test with your child.

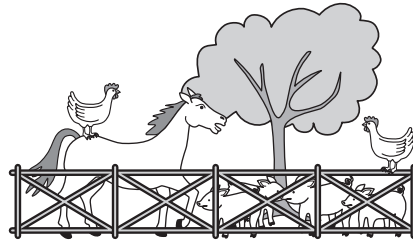
As you mark the test you will see the concepts or skills your child still has difficulty mastering and will need more practice. There are many good puzzle and problem solving sites on the internet.

Mastery Test—Problem Solving

- A. Find the facts in the letter which answer the questions that follow the letter.

Dear Mom and Dad,

I arrived at cousin Leanne's farm last Thursday. She is 12 years old, 2 years older than I am. She has lots of pets—2 dogs, 3 cats, a duck, and a pony. I did not know that living on a farm was such hard work. Every day we get up at 5:30 and do chores. I gathered eggs—25 on Saturday, 20 on Sunday, and 20 on Monday. I also helped with feeding the 12 pigs. Do you know that pigs eat 2 kg of food daily?!



Uncle Ed has 2 cars and 2 trucks, plus a big machine called a thresher which he won't be using until September. Leanne's 3 brothers have to work hard with the other chores. Aunt Emma likes to bake bread and we helped her bake 9 loaves of bread today. This will last us a week.

Well, I have to go!

Love, Kate

1. How old is Kate? _____
2. How many pets does Leanne have? (Do not include the pigs.) _____
3. On which day of the week were the most eggs gathered? _____
4. How much food do all the pigs eat each day? _____
5. How many children do Ed and Emma have? _____
6. How many vehicles do Kate's uncle and aunt have? (Do not include the thresher.) _____
7. How many days does the 9 loaves of bread last? _____
8. How many people (adults and children) are on the farm? _____

- B. Place your own numbers in the spaces in each problem, then solve the problem. Make sure you use numbers that are reasonable. (3 marks each)

Example:

Jack bought _____ pens which each cost _____¢. How much money did he spend?

Jack bought 4 pens which each cost 75¢. How much money did he spend?

$$\begin{array}{r} 2 \\ \$0.75 \end{array}$$

Show your work: $\frac{\times 3}{\$3.00}$ Statement: Jack spent \$3.00.

Paul is _____ cm tall. Bryan is _____ cm tall. How much taller is Bryan?
Show your work and write a statement.

- C. Answer the following problems by deciding which numbers to use and what operation is needed. Then, circle the correct operation.

1. The local police department bought 3 new patrol cars. Each car needed to have flashing lights placed on the roof. A set of lights costs \$370 to install. How much would it cost to put the lights on the 3 cars?

$$\$370 \div 3 \qquad \$370 \times 3 \qquad \$370 - 3$$

2. The track and field stadium has 50 rows of seats on the east side and 70 rows of seats on the west side. How many rows of seats are there in all?

$$50 + 70 \qquad 50 \times 70 \qquad 70 - 50$$

- D. Answer the problem by reading the question carefully, planning what operation to use, and carrying out your plan. Write a concluding statement and think: **Is this reasonable?**

The CN Tower in Toronto is 555 m (metres) high. The Eiffel Tower in Paris is 320 m high. How much higher is the CN Tower than the Eiffel Tower?



Statement: _____

- E. Read the following problem and underline what you think are the key words or parts in each. After that, put the information into number sentences and solve each problem.

Bob is three years older than John and John is five years older than Bill. Peter is older than everyone and he is two years older than the next oldest person in the group. If Peter is 15 years old, how old are the other boys in the group?

- F. Solve each problem that has enough information. If facts are missing, write which facts are missing, but do not solve the problem. Show work in the box.

Example:

Jack bought some golf balls and received \$2 change from \$20. How many golf balls did Jack buy?

Missing Information: How much did each ball cost?

Kazz rides her bike 4 km to school each day. Yesterday, she rode her bike 1 km, then she realized she had forgotten her library book. Kazz went home, then rode to school. After school, she rode straight home. How far did Kazz ride her bike yesterday?

Statement: _____

- G. Circle all of the unnecessary facts in the following problem.

Mrs. Smith looked at the apple selection at the store. Green apples were 98¢ per kg, red apples were \$1.25 per kg, and yellow apples were 69¢ per kg.

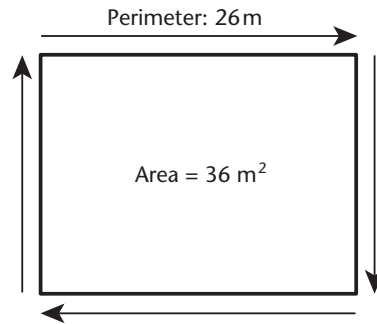
How much cheaper per kilogram were yellow apples than red apples?

H. Answer the problem using **guess and test** strategy.

1. *The area of a yard is 36 m^2 and the perimeter is 26 m . What is the length and width of the rectangular yard?*

(Area is the surface covering inside the yard. Perimeter is the distance around the yard.)

Area = length $\times$ width



Statement: _____

2. **How old am I?**

I am less than 15.

I am an even number.

I have 2 digits.

I am a multiple of 3.

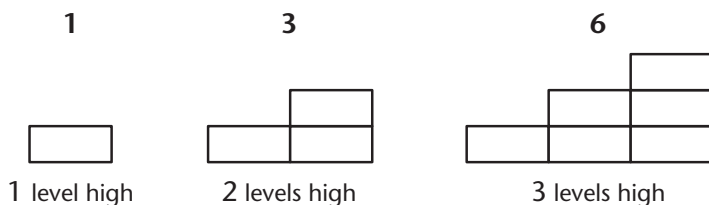
My age is _____.

- I. Use the digits 9, 8, 7, 6 to make 2 addition equations each with a sum greater than 175.

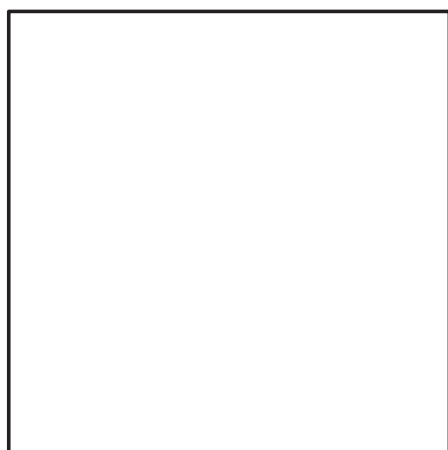
$$\begin{array}{r} \square \square \\ + \square \square \\ \hline \square \square \square \end{array}$$

$$\begin{array}{r} \square \square \\ + \square \square \\ \hline \square \square \square \end{array}$$

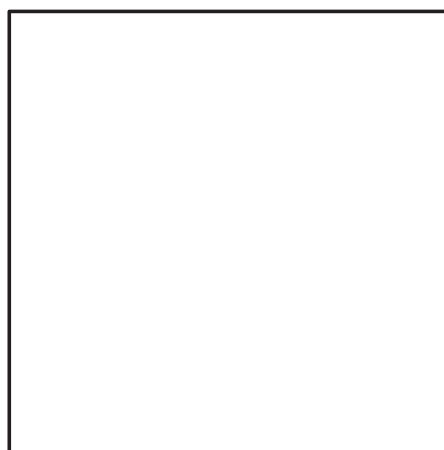
- J. How many blocks will be needed to complete the stairs so they are 6 levels high?



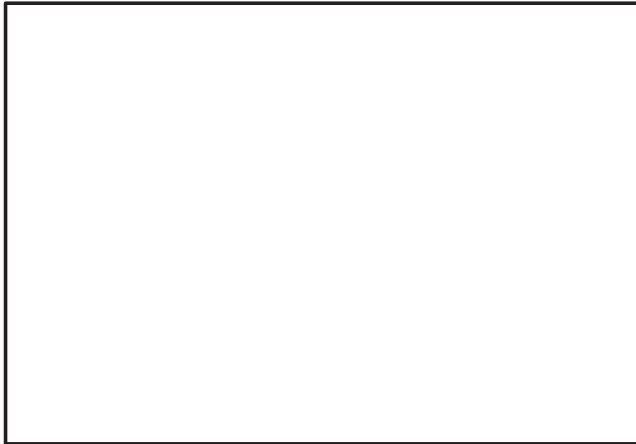
Draw the diagrams to find out how many blocks are needed for 4, 5, and 6 levels. Write the answer on the line provided.



4 levels high = _____ blocks



5 levels high = _____ blocks



6 levels high = _____ blocks

- K. Solve the problem by showing your work in the box and writing a statement answer.

The photographer was taking photos of the children at Hilldale Elementary School and Bench Elementary School. He took 624 pictures on his first visit. How many more photos does he need to take if there are 306 students at Hilldale School and 357 students at Bench School?

Statement: _____

- L. *There were 4 transportation vehicles—a bike, a car, a bus, and a plane—at the airport. They were each a different colour: yellow, red, blue, or green. What colour was the car?*

	Yellow	Red	Blue	Green
Bike				
Car				
Bus				
Plane				

Clues: The bus is yellow.

The bike was not red.

The plane's colour matched the colour of the sky.

Statement: _____

- M. Solve the problem by using ✓ and ✗ to determine the answer.

Use the clues to determine which sport each girl plays.

	Golf	Baseball	Soccer
Marie			
Jennifer			
Fiona			

Marie doesn't like golfing. Jennifer can't play baseball because it is at the same time as soccer. Fiona doesn't like team sports. They may play more than one sport.

Who plays soccer? _____

Who plays golf? _____

Who plays baseball? _____

N. Circle the best buy and show your work or explain your reasoning.

1. 500 g of roll-o-buds for \$1.45

or

1 kg of roll-o-buds for \$2.50

2. 250 mL of root beer for 89¢

or

1 L of root beer for \$3.80

O. Write the 24-hour time for each.

1. 6:00 p.m. _____

4. 4:30 a.m. _____

2. 11:00 a.m. _____

5. 10:00 p.m. _____

3. 2:30 p.m. _____

6. 11:15 p.m. _____

P. Complete the chart.

	Temperature	Change	New Temperature
1.	30°C	rise 17°C	
2.	45°C	drop 27°C	
3.	10°C	rise 14°C	
4.	-10°C	rise 15°C	
5.	-5°C	drop 7°C	

Q. Draw a number line to solve the problem. Write a statement answer.

A man entered the elevator on the main floor, went up 12 floors, then down 7 floors, up 6 floors, down 8 floors, and finally up 4 floors what floor did the man end up on?

Statement: _____

R. Can you complete these Martian Math questions? The  means to multiply the first number by itself and then subtract the number.

$$9 \quad \text{Martian Math symbol} \quad 72$$

$$3 \quad \text{Martian Math symbol} \quad 6$$

$$7 \quad \text{Martian Math symbol} \quad 42$$

$$10 \quad \text{Martian Math symbol} \quad \underline{\hspace{2cm}}$$

$$8 \quad \text{Martian Math symbol} \quad \underline{\hspace{2cm}}$$

$$16 \quad \text{Martian Math symbol} \quad \underline{\hspace{2cm}}$$

$$30 \quad \text{Martian Math symbol} \quad \underline{\hspace{2cm}}$$

Problem Solving

Practice Sheets

Lesson 1

Developing a Problem Solving Plan



Warm-Up

Circle the number that does not belong in each of the following groups.

1. 18 36 25 42 64

2. 500 200 600 800 400

3. $\frac{1}{3}$ $\frac{1}{5}$ $\frac{2}{10}$ $\frac{1}{2}$ $\frac{3}{8}$

4. 0.8 0.07 1.7 0.9 0.75

5. 101 77 1221 781 11

6. 45 15 50 75 60



It's Your Turn

Part A

What is the problem? What is a good plan to solve this problem?

1.



Problem: _____

Plan 1: _____

Plan 2: _____

2. Christopher has his sister's lunch—it has peanut butter sandwiches. He is very allergic to peanut butter and he has eaten half a sandwich.

Problem: _____

Plan 1: _____

Plan 2: _____

Part B

Write out two solutions to each problem.

Example: Which running shoes should you buy?

- a. Buy the ones that cost more, but last longer?
- b. Buy the ones that cost less because your feet are growing quickly and you will soon need larger shoes.

1. When should you do your homework?

a. _____

b. _____

2. Which way should you ride your bike to school?

a. _____

b. _____

3. What kind of gum should you buy?

a. _____

b. _____

Lesson 2

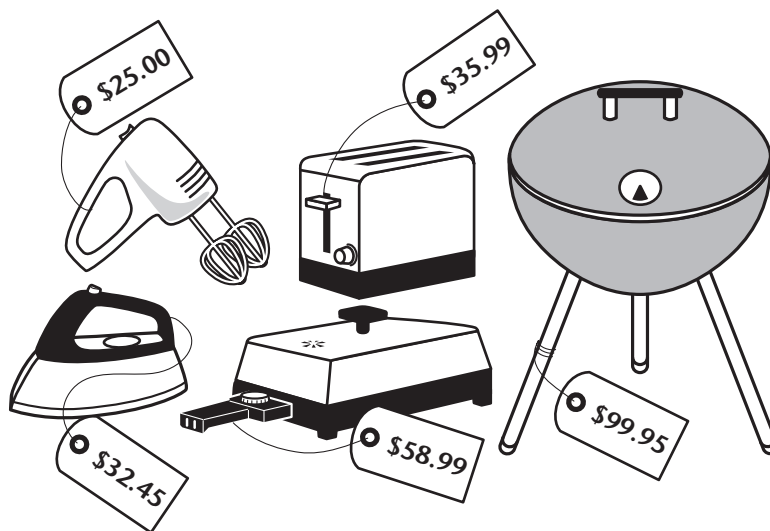
Finding Facts and Placing Numbers In Problem Statements



Warm-Up

Use the information in the pictures or chart to solve the problems.

1.



- What items cost more than \$40.00?

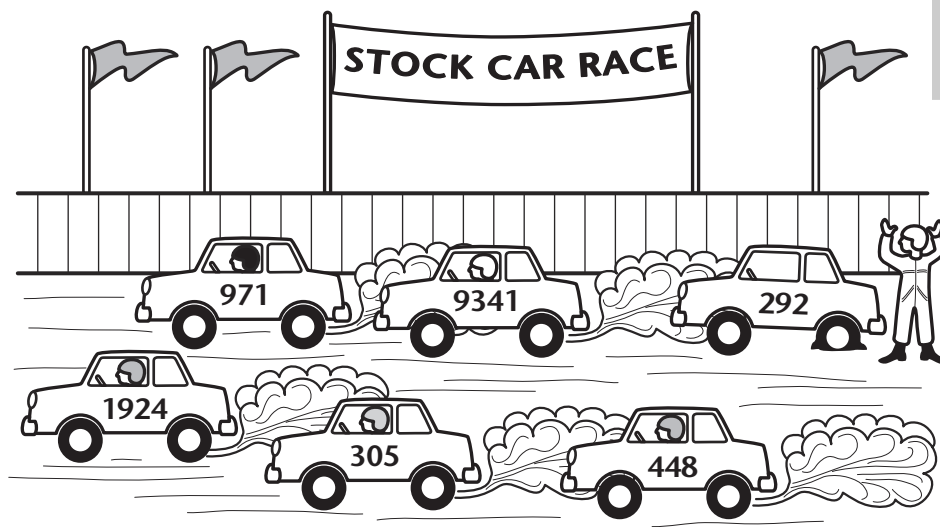
- What item costs the closest to \$100.00?

- What costs less—the electric mixer or the electric frying pan?

- What costs more—the toaster or the iron?

- What could you buy for about \$200.00?

2.



a. What is the number of the car with the flat tire?

b. In what position is car number 971?

c. What car has the same digits in the hundreds and tens place?

d. What cars have the same number in the hundreds place?

3.

ITEMS	NUMBER	TOTAL COST
Rabbits	20	\$67.50
Top Hats	5	\$22.50
Magic Wands	8	\$99.88
Scarves	35	\$35.00
Deck of cards	18	\$48.75

- a. How much do 8 magic wands cost? _____
- b. How many rabbits can you buy for \$67.50? _____
- c. What item does a magician need the least of in one year?

- d. What items costs the closest to \$40.00? _____
- e. What costs more—the rabbits or the decks of cards?

- f. What item costs less than \$30.00? _____



It's Your Turn

- A. Read the paragraph, then answer the questions. (You don't need to write full sentence answers.)

Jenny went berry picking on Thursday, Friday, and Saturday.

On Thursday she picked berries for 8 hours, dividing her time between picking 9 kg (kilograms) of raspberries and 4 kg of blackberries.



On Friday she picked only raspberries—4 kg in 4 hours. On Saturday Jenny worked for 10 hours, picking 6 kg of blackberries and 8 kg of raspberries.

Questions

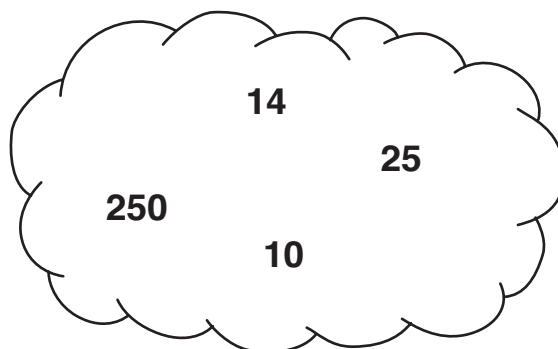
How many days did Jenny work?

How many kilograms of blackberries did she pick?

How many hours did she work in three days?

How many kilograms of fruit did she pick in all?

- B. Read the paragraph and decide where you think the numbers should go. The last step in your problem-solving plan—**Look Back**—is important. Does the paragraph make sense after you have placed the numbers?



Sagebrush Elementary School has (1) _____ students. There are (2) _____ classrooms with the average class having (3) _____ students. There are (4) _____ teachers on the staff.

Lesson 3

Choosing the Correct Operation



Warm-Up

Using a pattern chart makes it easier to solve some problems.

Example:

Problem: Roberta earns \$2.50 an hour for babysitting. How much money would she earn for 5 hours of babysitting?

Solution: Fill in a chart using the pattern: "Add \$2.50."

Hours	1	2	3	4	5
Money	\$2.50	\$5.00	\$7.50	\$10.00	\$12.50

After babysitting for 5 hours, Roberta earns \$12.50.

Use a pattern chart to solve these problems.

- Mrs. Black wallpapered her bedroom. She used 2 lengths of wallpaper for every 3 metres of wall. How many lengths of wallpaper did Mrs. Black use on 24 metres of wall?

Complete the chart to find the answer.

- William was asked to place markers around the track.

He put the first marker at 100 metres. Then he put a marker every 50 metres after that. How many markers did William need for 400 metres?

3. Alexandra saved pennies for one week. The first day she saved 1¢. Every day after that she saved twice as much as the day before. How much money did Alexandra save?



It's Your Turn

Part A

Indicate which operation—addition, subtraction, multiplication, or division—is needed to solve each problem.

Example:

8 rose bushes have an average of 22 buds on each bush. How many are on all the bushes?

Operation: **Multiplication**

1. A plane ticket from Vancouver to Prince George costs \$235, while a plane trip from Vancouver to Kelowna costs \$169. How much cheaper is the airfare from Vancouver to Kelowna?

Operation: _____

2. Sixteen firemen each ran 5 km to help raise money for sick children. How far did the firemen run in total?

Operation: _____

3. The Reds basketball team won 3 games at the Basketball Championship. The scores were 60-38, 50-46, and 42-30. How many points did the Reds score in all 3 games?

Operation: _____

4. 1000 sheets of paper have a mass of 2 kg. How much would 10 000 sheets of paper weigh?

Operation: _____

5. Sally had \$150 to spend on a 5-day trip. She decided to spend an equal amount each day. How much could Sally spend each day?

Operation: _____

6. The western border of Alberta is 1430 km long while the eastern border is 1280 km. How much shorter is the eastern border?

Operation: _____

Part B

1. Jenny has to practice piano for 40 minutes every day. How many minutes does she practice a week?

Operation: _____

Solution: _____

2. George has 60 minutes of free time, and wants to spend an equal amount of time with each friend. He has 4 friends. How long can he spend with each person?

Operation: _____

Solution: _____

3. Kerry has to be at school by 9:00 a.m. It takes her 5 minutes to brush her teeth, 10 minutes to shower, 10 minutes to eat breakfast, and 20 minutes to walk to school. At what time does she need to get up?

Operation: _____

Solution: _____

Lesson 4

Clarifying the Problem



Warm-Up

Try this!

What To Do

1. In a dish or other container, put a handful of stones or other objects you have available.
2. Guess how many of the objects are in the dish.
3. Now count the objects in the dish and see how close you were.
4. Try this several times, using different numbers of objects, and using different containers.
5. See if you can become more accurate as you continue.

It's Your Turn



Read the following problems and underline what you think are the key words or parts in each one. Then organize the information in each problem into number sentences and solve the problem.

1. Bob is three years older than John, and John is five years older than Bill. Peter is older than everyone and he is two years older than the next oldest person in the group. If Peter is 12 years old, how old are the other boys in the group?

2. Brian and his family do a lot of traveling. To serve as reminders of his trips, Brian collects bumper stickers from everywhere they go. He has twelve stickers from places in Canada, sixteen from the United States, twenty-one from places in Europe, and eighteen from places in the Orient. How many stickers does he have altogether? How many of those are from places outside North America?

Lesson 5

Too Many or Too Few Facts in Problems



Warm-Up

Read each problem carefully. Write the letter of the arithmetic that solves each problem. Then write a statement that answers the question.

A stock boy was asked to fill the shelves in a grocery store. He set out 250 mL and 750 mL ketchup bottles. He also set out 500 mL and 375 mL vinegar bottles.

$$\begin{array}{r} \text{A. } 750 \\ - 500 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B. } 500 \\ - 375 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C. } 750 \\ + 250 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D. } 375 \\ - 250 \\ \hline \end{array}$$

- How much more does a large vinegar bottle hold than a small vinegar bottle?

Example: _____

Statement: _____

- How much more does a large ketchup bottle hold than a large vinegar bottle?

Example: _____

Statement: _____

- How much more does a small vinegar bottle hold than a small ketchup bottle?

Example: _____

Statement: _____

4. How much do a small and large ketchup bottle hold together?

Example: _____

Statement: _____



It's Your Turn

Part A

Circle any unnecessary information in the following problems.

Example:

A van had 8 windows.

There were 3 people in the front seat and 6 more in the back.

How many people were in the van?

1. Mr. Davis paid \$250 for a sun roof. Tires for his car cost \$95. If he bought 5 tires, how much money did Mr. Davis spend on replacing his tires?
2. Jim sold lemonade for 35¢ a glass. He sold 40 glasses. He took \$10 out of his bank account. How much money did Jim take in from his lemonade sales?
3. All the skaters from the ice show lined up at the end of the show. There were 6 rows with 12 skaters in each row. There were 2000 spectators. How many skaters were in the show?

Part B

Write a statement telling what information is needed to solve the following problems.

Example:

Jack bought some tropical fish. He received \$4 change. How much did the fish cost?

Missing Information: What did Jack pay with—\$10, \$20, or \$50?

1. Each *Laugh* magazine sells for \$2.50. John bought a yearly subscription. How much did the subscription cost?

Missing Information: _____

2. How much ribbon will Di need for the dog show awards if each ribbon is 12 cm long?

Missing Information: _____

Part C

Solve the problems in Question A. Show your work and write a statement answer.

1.

Statement: _____

2.

Statement: _____

3.



Statement: _____

Part D

Answer the problem in the same way as the final lesson example (coin collection).

Mark had four fish tanks of various sizes in his room. He had six neon tetras, twelve English guppies, four angel fish, fourteen swordtails, and nine other fish whose names he could never remember. How many fish did Mark have that he could name?



Lesson 6

Eliminating Possibilities



Warm-Up

Cross out the two numbers that don't belong in each set.

1. 14, 35, 7, 8, 21, 11, 70
2. 2, 1, 8, 10, 3, 12, 16
3. 100, 171, 200, 500, 800, 405, 700
4. 7, 3, 24, 30, 9, 1, 12



It's Your Turn

Part A

1. List all the possibilities, then cross out the numbers that don't fit after each clue is given.

How old am I?

Clue #1:

I am less than 20.

List the possibilities from this clue.

Clue #2:

I am a multiple of 5.

Cross out all numbers that are not a multiple of 5 (Use the numbers you listed under Clue #1. You do not need to rewrite your list.)

Clue #3

I only have 1 digit.

Cross out 2-digit numbers.

Which number am I? _____

2. How old am I?

Clue #1:

I am between 30 and 40.

List the possibilities from this clue.

Clue #2:

I am an odd number.

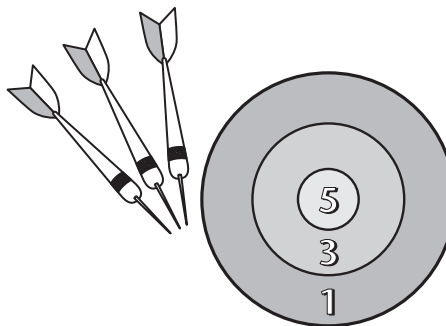
Clue #3:

Both my digits are the same.

I am _____ years old.

Part B

1. What scores are possible, using only 3 darts? Each dart must land within a circle and there are no misses.



Think: What is the lowest possible score? _____

What is the highest possible score? _____

2. Now list all the possibilities from the lowest to the highest.

Lesson 7

Using "Guess and Test" Techniques



Warm-Up

1. Write the numbers that are missing in each pattern.

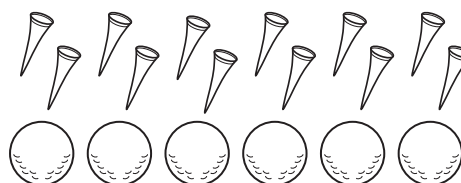
a.

20	40	61	83	106					236
----	----	----	----	-----	--	--	--	--	-----

b.

392	399	393	400		401				403
-----	-----	-----	-----	--	-----	--	--	--	-----

2. Maryanne went golfing with 12 tees and 6 golf balls. She lost 4 tees and 3 balls. What did she have left?



Statement:

3. Read the problem. Write the letter of the arithmetic that solves each problem. Then write a statement for each.

In the adult human body, there are 206 bones and 615 muscles. The skull is made up of 29 bones. The backbone is made up of 33 small bones.

A.
$$\begin{array}{r} 33 \\ -29 \\ \hline \end{array}$$

B.
$$\begin{array}{r} 615 \\ -206 \\ \hline \end{array}$$

C.
$$\begin{array}{r} 206 \\ + 615 \\ \hline \end{array}$$

D.
$$\begin{array}{r} 29 \\ + 33 \\ \hline \end{array}$$

- a. How many bones are there in the skull and backbone?

Example: _____

Statement: _____

- b. How many bones and muscles are there in the adult human body in all?

Example: _____

Statement: _____

- c. How many more muscles than bones are there in the adult human body?

Example: _____

Statement: _____

- d. How many more bones are there in the backbone than the skull?

Example: _____

Statement: _____

**It's Your Turn**

Solve each of these problems.

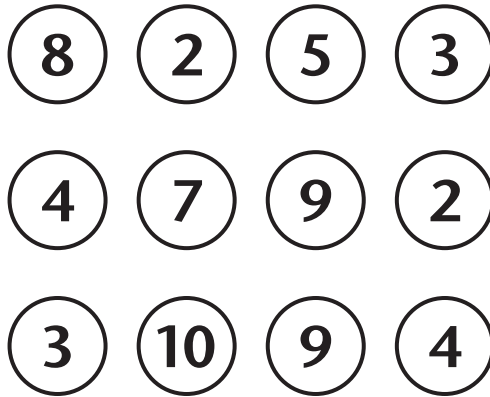
1. The sum of two numbers is 26. The difference is 2. What are the numbers?

Statement: _____

2. Lance counted some chickens and cows in the barnyard. If there were 12 animals and 40 legs in all, how many animals were cows?

Statement: _____

3. Move one circled number to another row so all the rows have the same sum. Use an arrow to show the move.



Lesson 8

Estimating Answers to Problems



Warm-Up

Solve these problems by the “guess and test” method to see if they are correct. If the first guess is not correct try a better guess.

1. The sum of two numbers is 27. One number is 3 more than the other number. What are the numbers?

2. The product of two numbers is between 30 and 40. One number is 5 more than the other number. What are the numbers?

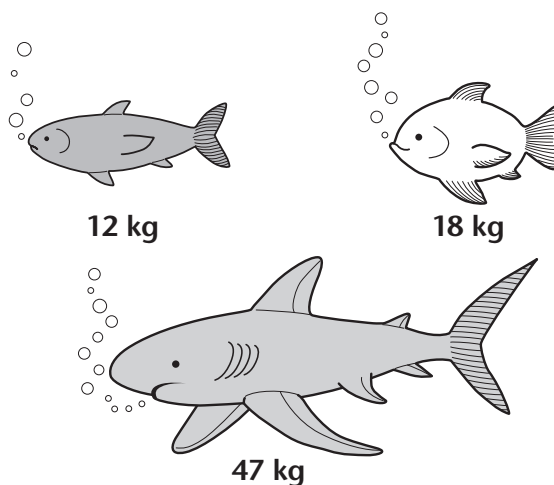


It's Your Turn

Part A

Circle the most reasonable answer for each problem. Use estimation. Trust yourself not to calculate exact answers.

1. What is the total mass of the 3 fish?



- a. 50 kg b. 80 kg c. 100 kg
2. The Anderson family bought a set of 30 nature books. Each book cost \$12.95. About how much did the entire set cost?
- a. \$100 b. \$200 c. \$400
3. Kim bought an \$8.99 CD each month for a year. How much did Kim spend on CDs in a year?
- a. \$1078 b. \$107.88 c. \$10.78
4. Elizabeth bought a mountain bike that normally costs \$450. She only paid half price because the bike was on sale. How much did the bike cost?
- a. \$900 b. \$49.50 c. \$225

5. Tanya drinks $\frac{1}{2}$ L (litre) of milk a day. How much milk does Tanya drink in a month?
- a. 30 L b. 15 L c. 5 L
6. Six tickets to a concert cost \$53.70. What will 15 tickets to the same concert cost?
- a. \$105 b. \$134.25 c. \$235.75

Part B

In the following problems, round the numbers so you can estimate a reasonable answer. Show your work and write a statement answer.

Example:

A 747 jetliner can hold 472 people. 139 seats were empty. About how many people were on the plane?

$$\begin{array}{rcl} 472 & \rightarrow & 470 \\ 139 & \rightarrow & \underline{-140} \\ & & 330 \end{array}$$

There were about 330 people on the plane.

1. The Jacksons drove 447 km on Monday, 411 km on Tuesday, and 661 km on Wednesday. About how far did the Jacksons drive in the 3 days?

2. The science textbook has 18 chapters with 23 pages in each chapter. About how many pages are in the book?

3. Three brothers collected 295 baseball cards then divided them evenly. About how many cards did each brother receive?

Part C

Circle the most reasonable answer in each question.

1. 2 newborn twins weigh about:

6 grams 6 kilograms 6 milligrams

2. The combined ages of Jim and his grandfather is about:

30 years 75 years 180 years

3. The tallest building in the world has about:

10 floors 100 floors 1000 floors

4. The distance around the middle of the Earth is about:

400 km 4000 km 40 000 km

Lesson 9

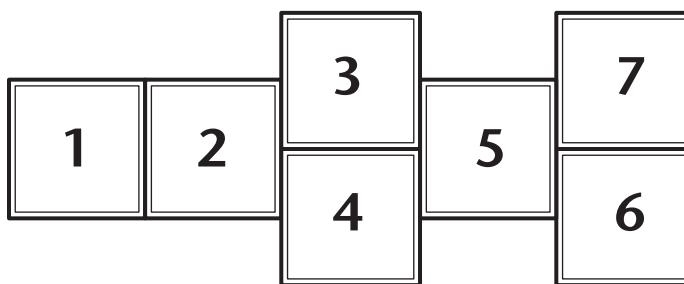
Problem Solving: Diagrams



Warm-Up

Part A

Let's play Hopscotch!



1. What three squares can you hop on to score 16?

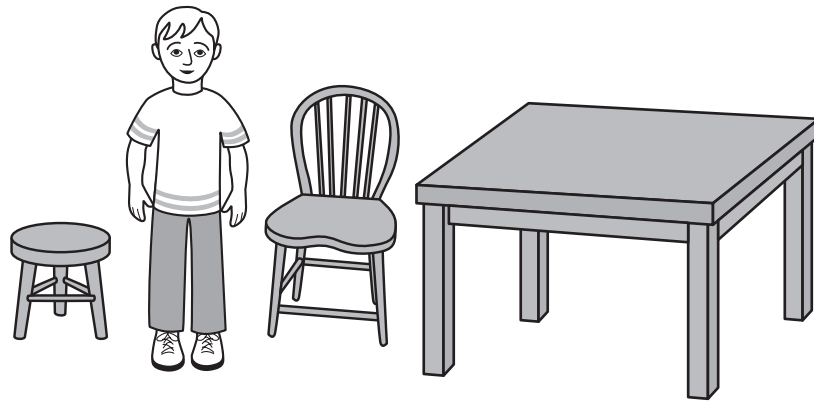
2. What three squares can you hop on to score 11?

3. What three squares can you hop on to score 15?

4. What three squares can you hop on to score 13?

Part B

Each of these objects has legs.



1. How many chairs and stools would you need to have 21 legs?

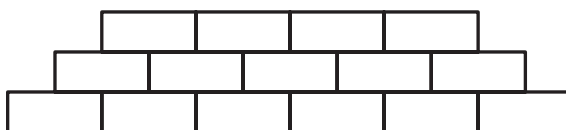
2. How many tables and stools would you need to have 30 legs?

3. How many stools and people have 41 legs between them?

**It's Your Turn**

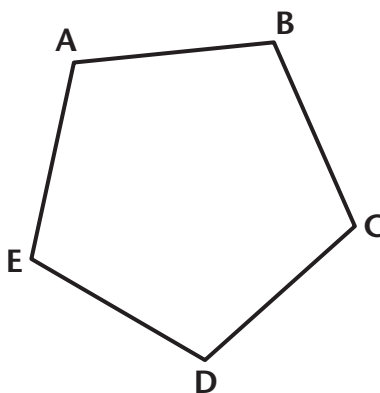
Each diagram has been started for you. You are to complete each diagram and write a concluding statement (answer statement).

1. How many blocks are in a pyramid that starts with 6 bricks on the bottom row?



-
2. There are five cities (A, B, C, D, and E) which are all connected to each other by water canals. How many canals are there in all?

Hint: City A is connected by separate canals to each of the other four cities.



3. There are six Clydesdale horses in the County Fair Parade. Each horse measures 3 m (metres) in length and there is a 4-m space between each horse. How long is the line of horses? Draw your own diagram for the problem. It's easier than it looks!

Lesson 10

Looking for Patterns



Warm-Up

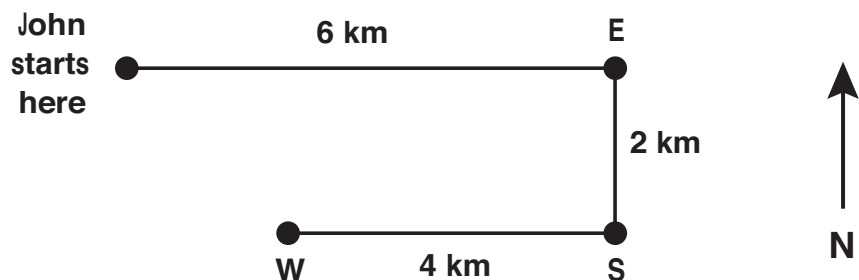
Solve the following problems.

1. Matt has four pairs of socks: orange, lime green, hot pink, and blue. He sometimes wears two different-coloured socks at a time. How many different combinations of socks can he wear?
Orange = O Green = G Pink = P Blue = B

Heres a start:

Orange	Green	Pink	Blue
G	P	B	O

2. John went hiking and headed east for 6 km (kilometers). Then he went south for 2 km and west for 4 km. He then hiked 5 km north from that point. If John were to get back to where he started, describe which direction or directions he must go and how far he must hike. Complete the diagram.



It's Your Turn

1. Complete each of the following patterns.

a. 3, 6, 9, _____, _____, _____

b. 1, 5, 9, 13, _____, _____, _____

c. 480, 240, 120, _____, _____, _____

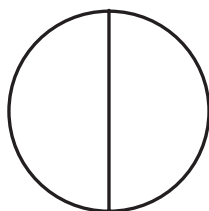
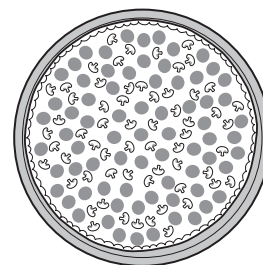
2. Mike earns \$4.50 a day delivering papers. How much does he earn in 8 days? Write a concluding statement.

Complete the table.

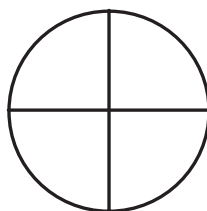
Day	1	2	3	4	5	6	7	8
Earnings	\$4.50	\$9.00	\$13.50					

Statement: _____

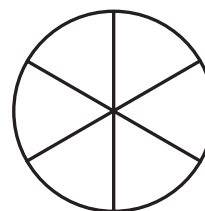
3. How many pieces of pizza would you have after 5 cuts?



1 cut



2 cuts



3 cuts

Lesson 11

Problem Solving: Organizing Data



Warm-Up

Draw the next two figures to complete each pattern.

1		?	?
2		?	?
3		?	?
4		?	?



It's Your Turn

- Chris has some nickels and dimes in his pocket. He has 3 times as many dimes as nickels. If he has \$2.10 in all, how many nickels does Chris have?

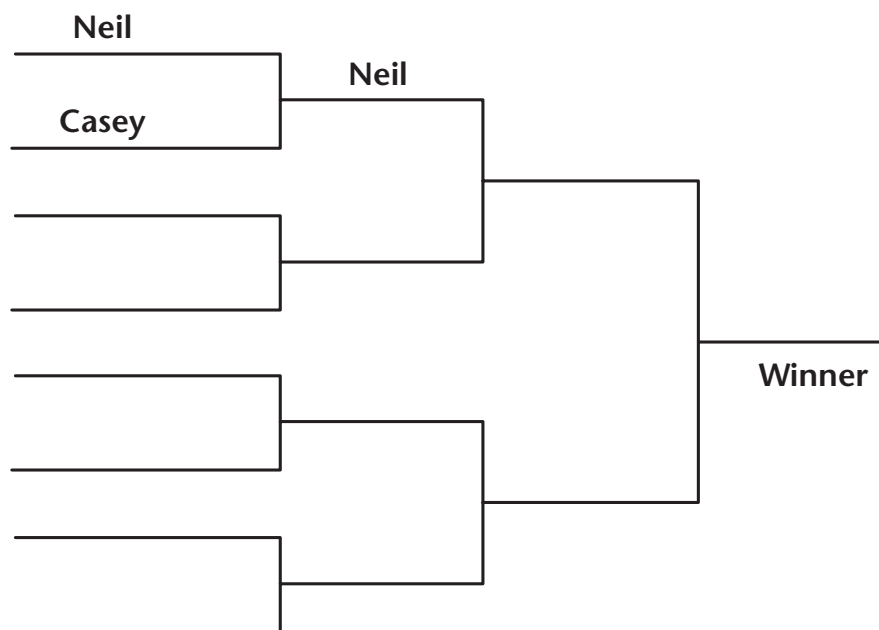
Complete the chart below. Write a statement.

5¢		10¢		Total
Amount	Value	Amount	Value	
1	5¢	3	30¢	35¢
2	10¢	6	60¢	70¢

Statement: _____

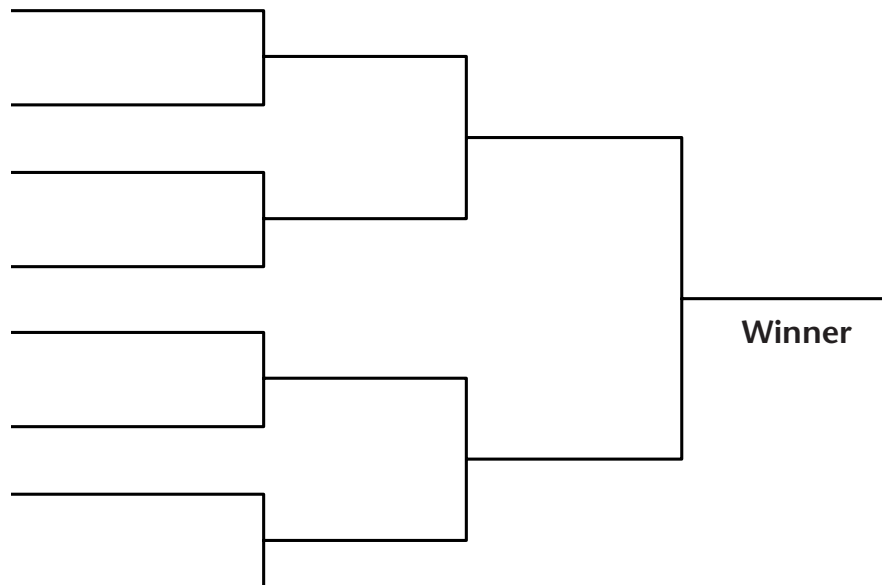
2. Eight boys were in a ping pong tournament. Neil defeated Casey. Spencer defeated Bryan and Neil, but lost to Jim. Alex defeated John but lost to Jim. Bart was defeated by Jim.

Use the chart below to see who won the tournament. The information from the first clue has already been entered on the chart.



3. Here's what happened in the local baseball tournament. Make a chart similar to the one in Question 2 to show the results.

The Oilers defeated the Braves, but lost to the Flames, who defeated the Knicks. The Cougars lost to the Steelers, who later lost to the Bengals, who defeated the Reds and the Flames.



Who won the baseball tournament? _____

Lesson 12

Multi-step Problems



Warm-Up

Jill has a pair of red corduroy pants and a pair of black slacks. She has a white sweater, a blue one, and an orange one. How many different outfits can Jill wear? Write a statement answer.

Hint: Make a list.

Statement: _____

**It's Your Turn**

Follow the correct steps and solve each problem. Show all your work. Write a concluding statement for each problem.

1. How much money does Louise have left from \$10 after she spent \$4.25 on lunch and \$2.50 on a movie?

Step 1: Money spent

Step 2: Subtract money from \$10.

Statement: _____

2. Five boys earned and shared \$75.00. One of the boys, Wes, earned \$16 more. How much did Wes have altogether?

Statement: _____

3. Terry rented a DVD that ran for 148 min. On Monday he watched 64 min. of the DVD. He watched the rest of The DVD on Tuesday. How many more minutes did Terry watch on Tuesday than on Monday?

Statement: _____

4. How much money was raised at the car wash if each car was washed for \$4.00.

Dates	Cars Washed
Friday	27
Saturday	62
Sunday	59

Statement: _____

Lesson 13

Logical Thinking



Warm-Up

1. Posters sold for \$1.25. Suzanne bought nine posters. How much change did she receive if she paid with a \$20 bill?

Statement: _____

2. Marie works five days a week for four hours a day. She is paid \$5 an hour. She also earns \$6 a day in tips. How much does Marie earn in a week?

Statement: _____

Statement: _____



It's Your Turn

- A. Use an ✕ or a ✓ to complete the table and solve the problem. Use the clues to find the answer to each problem. Write a statement answer.

Jack and Fran have pets; one has a canary and one has a goldfish. Fran cleans her aquarium each week. Who has which pet?

	Fran	Jack
Canary		
Goldfish		

Statement: _____

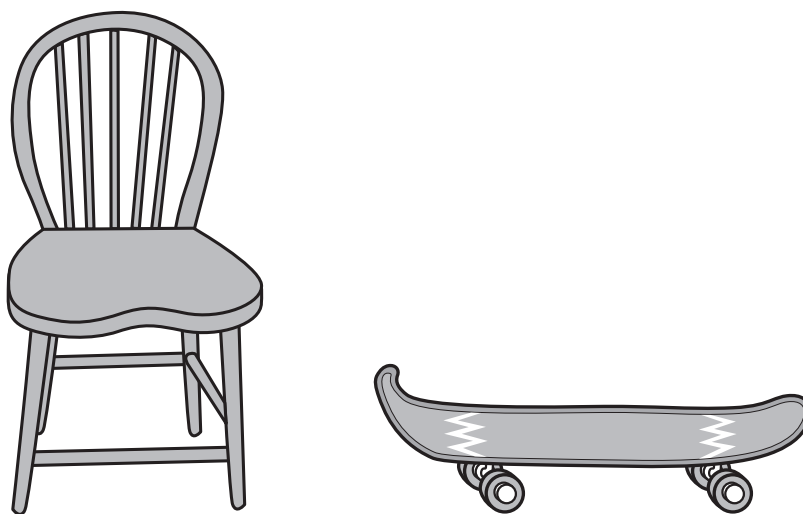
B. Use the chart to answer the questions.

	Brown hair	Blonde Hair
Short	Madison, Lisa, Adam, Lucas	Kate, Jordan Lauretta
Tall	Michael, Angela, Alexa	Nicole

1. How many short people are there with brown hair? _____
2. How many tall people are there with blonde hair? _____
3. Are there more short people with blonde hair than short people with brown hair? _____
4. Which group has the most people in it? _____

C. Solve the problem by working backwards from what you know to what you need to know.

2 skateboards and 1 chair weigh the same as 5 skateboards.



If 1 skateboard weighs 4 kg, how much does 1 chair weigh?

Lesson 14

Problems: Mass and Capacity



Warm-Up

A. Write in the missing numbers in these patterns.

1.

10	20	40	70					370	
----	----	----	----	--	--	--	--	-----	--

2.

72	79	70	77	68			73		
----	----	----	----	----	--	--	----	--	--

B. 1. Write the items from the list in the correct place on the diagram.

tomatoes	apples	fire truck
chocolate	watermelon	potatoes
grass	stop sign	strawberries
peanut butter	cookies	pickles

	Things you can eat	Things you can't eat
Red		
Not Red		

2. Answer the questions using the information in your diagram.

a. How many items are red and can be eaten?

b. How many items are not red and can be eaten?

c. How many red items cannot be eaten?

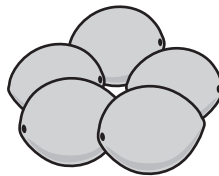


It's Your Turn

A. Find the cost of buying 2 kg of each item.



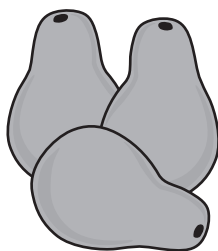
\$0.59/kg



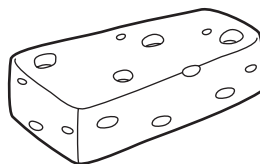
\$0.89/kg



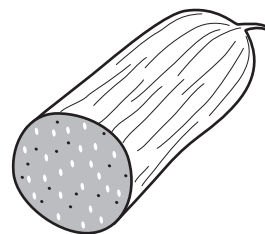
\$1.95/kg



\$1.25/kg



\$4.50 per 500 g



\$1.80 per 500 g

Example:

Onions: **\$0.59**

$$\begin{array}{r} \text{\$0.59} \\ \times 2 \\ \hline \end{array}$$

2 kg = \$1.18

1. Limes: cost of 2 kg = _____

2. Ground Beef: cost of 2 kg = _____

3. Avocado: cost of 2 kg = _____

4. Cheese: cost of 2 kg = _____

5. Salami: cost of 2 kg = _____

B. Which is the better buy:

1. A 500 mL of cola for \$1.05 or a litre bottle of cola for \$1.90?

Explain: _____

2. A frozen apple juice that makes 400 mL for \$1.60 or one that makes 300 mL for \$1.20?

Explain: _____

- C. Which is the better buy? Calculate a similar amount to see which item will cost less. Underline the cheaper one. Show your working.

Example:

Oranges at 48¢ for 200 g $\rightarrow 48¢ \times 3 = \1.44 for 600 g

Oranges at 58¢ for 300 g $\rightarrow 58¢ \times 2 = \1.16 for 600 g

1. Chocolate milk at \$1.10 for 500mL

or

Chocolate milk at \$2.15 for 1L

2. Pears at \$3.30 for 3 kg

or

Pears at 49¢ for 500 g

Lesson 15

Problems: Temperature and Time



Warm-Up

Complete the following problems. Show your work in the box and write a final statement answer.

1. Will the jug hold both cans of orange juice if each can makes 780 mL of orange juice?



Statement: _____

2. One egg has a mass of 50 g (grams). What is the mass of a dozen eggs?

Statement: _____



It's Your Turn

Part A

- Find the **mean** temperature for these B.C. cities on September 10th.

	City	High	Low	Mean
a.	Penticton	32°C	20°C	
b.	Fernie	24°C	12°C	
c.	Nanaimo	28°C	18°C	
d.	Prince Rupert	14°C	8°C	
e.	Bella Coola	16°C	10°C	
f.	McBride	20°C	6°C	

- Use a calculator to find the average daily temperature for Oliver, B.C. during the month of May. The temperature for each day is shown on the calendar.

1	2	3	4	5	6	7
15°C	14°C	19°C	21°C	17°C	14°C	18°C
8	9	10	11	12	13	14
15°C	19°C	16°C	16°C	18°C	17°C	15°C
15	16	17	18	19	20	21
22°C	23°C	17°C	21°C	22°C	22°C	25°C
22	23	24	25	26	27	28
29°C	28°C	31°C	28°C	27°C	29°C	32°C
29	30	31				
30°C	30°C	30°C				

Part B

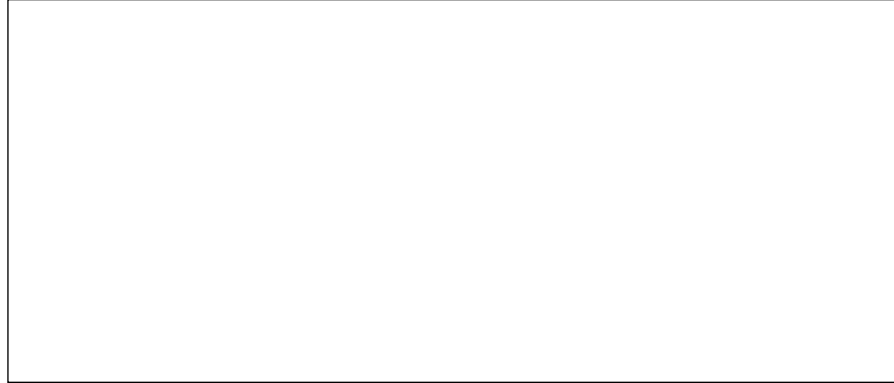
1. Write these times as 24-hour clock times.

Example: 2:10 = 14:10

- a. 4:00 p.m. _____
- b. 10:00 a.m. _____
- c. 6:30 p.m. _____
- d. 8:15 p.m. _____
- e. 4:05 a.m. _____
2. When it is 10:00 in Vancouver, it is 13:00 in Toronto. We say Toronto time is 3 hours ahead of Vancouver time. Complete the table to show the times in Vancouver and Toronto. Use 24-hour time. The first one is done as an example.

Vancouver	Toronto
a. 7:30	10:30
b.	11:00
c. 22:00	
d.	17:00
e. 11:00	

3. Jackson the baker finished baking 1:15 p.m. He had been baking for 7 hours and 45 minutes. What time did he start? Make sure you show all your work.



Statement: _____

Lesson 16

Problems Using Vertical and Horizontal Number lines



Warm-Up

Solve the following problems.

1. The mean temperature in Kelowna is 22°C . The mean is the average of the highest and lowest temperatures for the day. If the lowest temperature is 10°C , what was the highest temperature?

Statement: _____

2. Joseph played soccer for 1 hour and 15 minutes in the morning, and $1\frac{3}{4}$ hours in the afternoon. How long did he spend playing soccer?

Statement: _____



It's Your Turn

Part A

Underline the words Horizontal Number Line or Vertical Number Line to show your choice. Write an explanation for your choice.

Example: Show how many kilometres Len ran on Monday, Tuesday, and Wednesday.

Vertical or Horizontal
Number Line Number Line

Why: People travel along a road or trail. It is a horizontal motion.

1. Show how far John climbed up a mountain each day

Vertical or Horizontal
Number Line Number Line

Why: _____

2. Show how far the Anderson family traveled on their vacation each day.

Vertical or Horizontal
Number Line Number Line

Why: _____

Part B

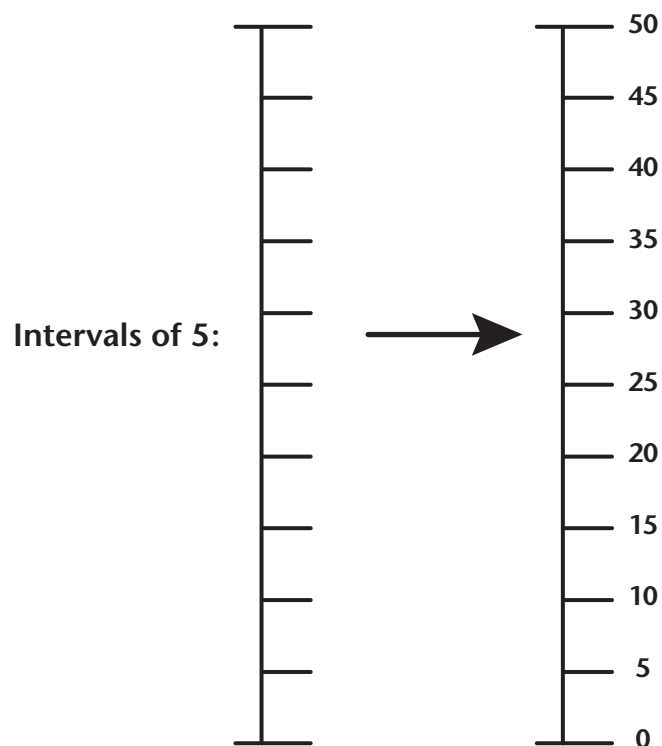
Create a vertical or horizontal number line to solve each problem.

1. A woman in an elevator was on the ground floor of an apartment building. The elevator went up 6 floors, down 2 floors, then up 9 floors where the woman got off. What floor was she on?
2. Each day a commuter train travels 80 km from Yale to Boston. The train goes halfway back to Yale, then turns around and goes halfway back to Boston before returning to Yale. How far does the train travel?

Part C

Mark the suggested intervals on each of the number lines.

Example:



1. Intervals of 1:



2. Intervals of 2:



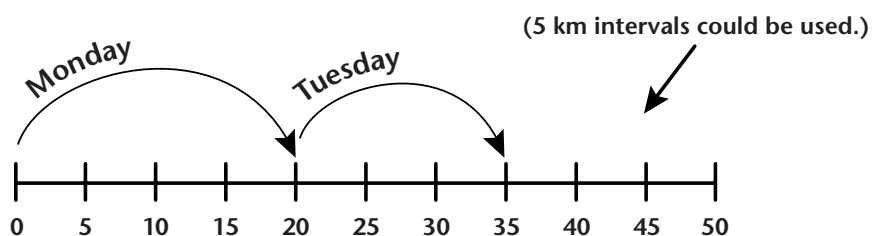
Lesson 17

Puzzle Problems



Warm-Up

1. What intervals would you use to show the following?



- a. Sarah walked 3 km on Monday and 4 km on Tuesday. Use arrows $\rightarrow$ to show the distance walked each day.

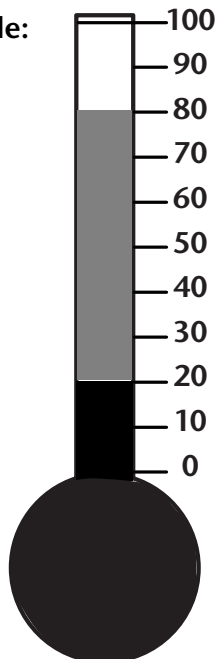


- b. The Lovetts travelled 30 km on their bikes on Saturday and 50 km on Sunday.



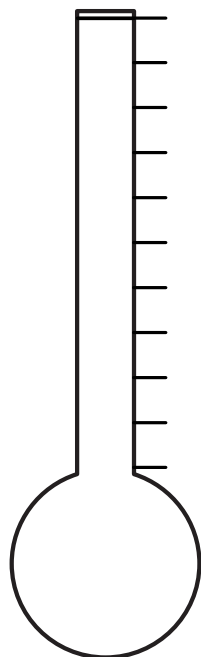
2. What intervals would you place on the thermometer to answer the following questions? Shade in the temperatures changes listed in each question.

Example:



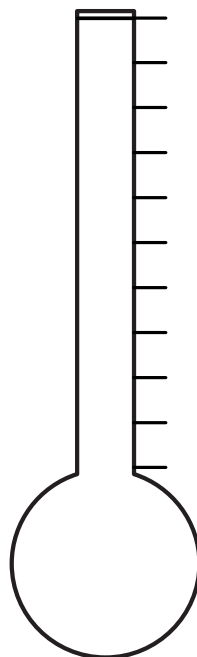
Show the temperature of water rising from 20°C to 80°C .

Intervals would be 10°C intervals.



Show the temperature of water rising from 4°C to 14°C .

a. _____



Show the temperature of water rising from 1°C to 8°C .

b. _____



It's Your Turn

A. Try this Sudoku puzzle.

Using the digits from 1–9, fill in the blank squares. Each line across and down must have each digit from 1–9, and no digits can be repeated. Also, each 3 x 3 grid must contain each digit from 1–9 and no repeats.

Have fun!

5		2			9		4	
3				4				
	7		5		3		9	
7		6		9	8			
		4				1		
			1	7		8		4
	5		9		1		3	
				8				6
	2		3			7		8

- B. Fill in the missing letter in each word. Write that letter in the line with the same number to find the six letter keyword that describes this type of problem.

1 2 3 4 5 6

1. wi ____ h

2. roa ____

3. d ____ me

4. pa ____ e

5. ca ____ e

6. ____ our

- C. Just for fun!

The answer to each question is a pair of rhyming words. The rhyming words are another way of saying the same thing. You may need to use a dictionary to find out the meaning of some of the words used.

Example: chubby feline = fat cat

1. Maraschino boat that takes cars = _____

2. Sofa pocket = _____

3. Indigo footwear = _____

4. Five cent dill = _____

5. Large group of noisy people = _____

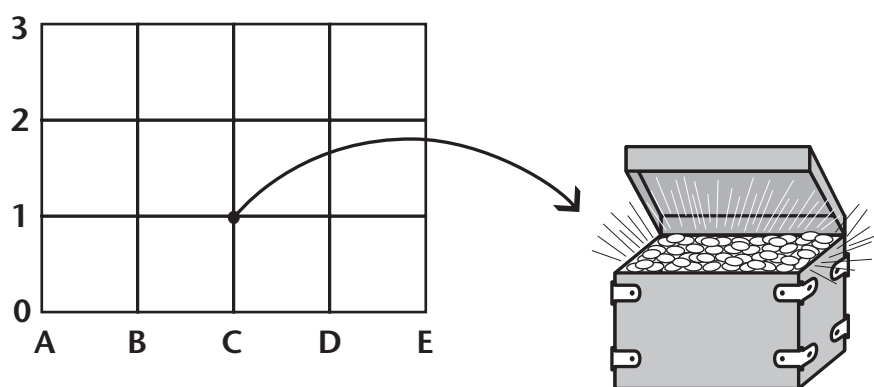
Games

Your child may enjoy playing the following commercially-produced games. You can find most of these games in the game section in toy stores or the toy section of department stores.

- Uno
- Yahtzee
- Racko
- Wizard
- Dominoes
- Skip Bo
- Battleships and Cruisers

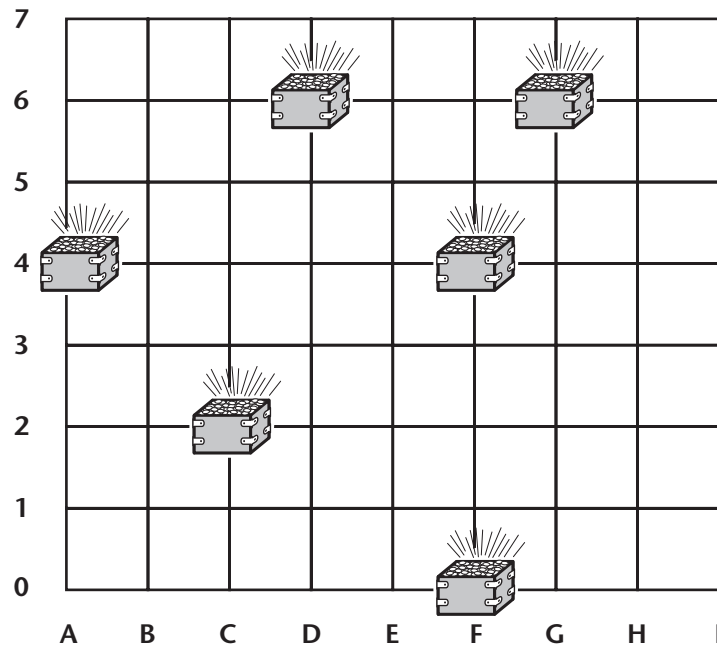
Treasure Hunt

In this game players will learn to locate the treasure using numbers and letters on a grid.



Players try to guess the location of the treasure. The treasure is hidden somewhere on the grid where the horizontal and vertical lines meet. To find the treasure, players take turns calling out positions, for example, C1. The first player to call out the correct position (positions) of the treasure is the winner.

Here is an example of a Treasure Map grid that can be made.



Fat Cat

Number of Players: 3 to 13. Best played by 4.



What You Need:

- a deck of cards

Cards:

Take out sets of four identical cards, with as many sets as there are players. Sets are made of 4 Kings, 4 threes, 4 nines, etc. Three players would use three sets (12 cards).

Deal:

Choose one player to shuffle the cards and deal four cards to each player, one at a time.

How to Play:

1. After a player has looked at his or her cards, she or he places one card face down, in front of the player to his or her left.

2. Each player picks up the card and adds it to her or his hand.
3. Continue to pass cards until one player has four cards of a set.
4. As soon as a player collects a set, he or she stops exchanging and puts one hand on the top of her or his head.
5. Other players are to stop play and also put their hands on their heads.
6. The last player to do this becomes the “Fat Cat,” loses the game, and become the next dealer.

Scoring:

The first player to make a set	10 points
Last player “Fat Cat”	0 points
Remaining players	5 points

The first player to reach 50 points is the winner.

Ninety-Nine

Number of players: 3 to 5, but best for 4

Cards:

The cards are ranked from King down to Ace. Face cards count 10 each, ace 1, and other cards their face value.

Game Cards:

The 4, 9, 10, and King of each suit are known as Game Cards and have special jobs.

- A **four** played on any discard pile reverses the flow of play from clockwise to counterclockwise or vice versa, returning the play to the player who **last** played their card.
- A **nine** played at any time puts the total of the discard piles at 99 or, when played on a pile already totalling 99, maintains the total at 99.
- A **ten** reduces the count of the discard piles by 10.
- The **king** holds the count at ninety-nine and there is no change in the total.

Deal:

Three cards are dealt to each player, one at a time. The rest of the pack is placed face down in the center of the table, forming the stock pile. Each player is also given three chips, or three jelly beans, or three of some other small item.

How to Play:

1. The player to the right of the dealer starts by placing one of his or her three cards face up in front of him or herself, calling out the face value of that card. This is the starter card.
2. The player then draws a card from the stock to replace the card played. If the card is not picked up immediately, the player then only has two cards to play with.
3. The next player plays a card in front of him or herself, calling out the total face value of the two cards and then draws a card from the stock.
4. Each player in turn repeats this procedure, adding the value of his or her card to the cumulative total of the discard piles.
5. Game cards can be used at any time once play has started. Use the rules above to determine what those cards do.
6. The total of the cards in the individual discard piles cannot be increased beyond 99. A player who has no card or Game Card that can be played to reduce or maintain the total of 99 is forced to pass. He or she places a chip (or other item) in the kitty as a penalty.
7. To start the next hand the cards are gathered up, shuffled, and dealt by the person sitting to the right of the last dealer.
8. After three passes, a player may remain in the game and play "on honours" until forced to pass one last time. At this time the player is out of the game and forfeits all the items he or she has deposited in the kitty.
9. Play continues until only one player remains in the game. This player is the winner and collects the kitty.

Spades

This game has relatively easy bidding, playing, and scoring.

Number of players: Four in two partnerships.

Cards:

A pack of 52 cards. They rank A (high), K, Q, J, 10, down to 2. Spades are **trumps**.

Deal:

Thirteen cards are dealt to each player, one at a time.

Bidding:

The game consists of thirteen tricks. Starting with the dealer, and moving to the left, each player in turn bids the number of tricks he or she expects to win. His or her bid is added to that of his or her partner to form the contract bid by that partnership.

It is not necessary for the total of the contracts bid by the two sides to equal 13 tricks. The total can be more or less.

A player who does not expect to win any tricks may bid “nil” and discard three cards from his hand, face down, in the center of the table. If his partner has already bid, the partner gives him three cards from his hand and picks up the three discards. If partner has not yet bid, he must wait until after he has bid to make the exchange.

Before looking at his hand a player may bid “double nil” and bonuses or penalties are doubled (explained below). As in bidding “nil”, he discards three cards for his partner and receives three in return.

If both partners bid “nil” or “double nil” there is no exchange.

How to Play:

1. The player at the left of the dealer leads first and may play any suit **except** Spades, which may not be led until the suit is “broken” by a spade being discarded on a trick. A player must follow suit if he or she is able. If a player has no cards in the suit led he or she can play a spade or trump card.
2. A trick is won by the highest card of the suit led or by the highest trump played.

Scoring:

The object of the game is to take at least as many tricks as bid by the side (partnership). If one partner has bid “nil”, his contract and his partner’s are scored separately and then the scores are combined.

Each trick bid counts 10 points for a side if the contract is made, against a side if the contract is set (not met). A side may have a minus score.

Overtricks (more tricks than bid) count 1 each.

A bid of “nil” receives a bonus of 100 points if made (no tricks are taken), or a penalty of 100 points if set (player is forced to take a trick or tricks).

The bonus or penalty for “double nil” is 200 points.

If both partners bid “nil” or “double nil” the side receives 200 points if both make their contract, but there is no score if either or both are set.

A game consists of 500 points. If the two sides both go over 500 points in the same hand, the one with the larger score is the winner.

Two-Hand Spades

Number of Players: Two

Cards:

A pack of 52 cards. They rank A (high), K, Q, J, 10, down to 2. Spades are **trumps**.

Deal:

1. The deal alternates between the two players. The cards are shuffled by the dealer and the deck is placed face down in the center of the table to form the stock.
2. The non-dealer starts by taking the top card from the stock. If he wants to keep it in his hand he looks at the second card from the stock and discards it face down beside the stock to begin the discard pile. He may discard the first card and keep the second card drawn.
3. Both players in turn discard one card and keep one card until the entire stock has been drawn. Each player will then have a hand of 13 cards and bidding and play proceed as in Spades. The discard pile is not used in the play.

Decimal Game



What You Need

- player cards (in Teaching Aids)
- 2 sets of 10 small cards numbered from 0 to 9 placed in a lunch-sized paper bag
- pencils
- a partner

How to Play:

1. Take out a player card for each player.
2. Take turns drawing a numbered card from the paper bag.

3. After each turn, write the digit in a box in Row 1 on your playercard. Return the card to the bag.
4. Continue until all 3 boxes in Row 1 are full on both player cards.
5. Compare your numbers. The player with the lesser number wins a point.
6. Play four more rounds.
7. The player with the highest score wins.
8. Play the game again. This time the player with the larger number wins a point.

Problem Solving

Answer Key

Answer Key



Lesson 1 Developing a Problem Solving Plan

Warm-Up

1. 18 36 (25) 42 64 odd number
2. (500) 200 600 800 400 odd number
3. $\frac{1}{3}$ $\frac{1}{5}$ ($\frac{2}{10}$) $\frac{1}{2}$ $\frac{3}{8}$ 2 in numerator
4. 0.8 0.07 (1.7) 0.9 0.75 only number bigger than 1
5. (101) 77 1221 781 11 not a multiple of 11
*true, but could also be 781.
6. 45 15 (50) 75 60 not a multiple of 15

It's Your Turn

- A. Answers will vary. These are sample answers.
1. Problem: There are too many students for the bus.
Plan 1: Perhaps some students will walk home or go by bike.
Plan 2: Perhaps a parent could drive 5 children.
 2. Problem: Christopher has eaten some peanut butter and he is allergic to it.
Plan 1: Perhaps he has allergy medicine with him.
Plan 2: Dial 911 (if he is in a large city). Phone an emergency number quickly.

- B. Answers will vary. These are sample answers...the idea is for the learner to think of more than one solution.
1. (a) as soon as you get home from school
(b) at the same time as usual—e.g., after dinner
 2. (a) the shortest way
(b) the safest way
 3. (a) bubble gum to blow bubbles
(b) sugarless gum to save your teeth



Lesson 2

Finding Facts and Placing Numbers in Problem Statements

Warm-Up

1. (a) Electric frying pan and barbeque
(b) The barbeque
(c) The electric mixer
(d) The toaster
(e) Suggested answers: The barbeque, the toaster, the iron, and the mixer.
or The electric frying pan, the barbeque, and the toaster.
2. (a) Car 292
(b) Second position
(c) Car 448
(d) Cars 971 and 1924
3. (a) \$99.88
(b) 20 rabbits
(c) Top Hats
(d) Scarves
(e) Rabbits
(f) Top Hats

It's Your Turn

- A.
1. 3
 2. 10 kg
 3. 22 hours
 4. 31 kg
- B.
1. 250 students
 2. 10 classrooms
 3. 25 students
 4. 14 teachers



Lesson 3

Choosing the Correct Operation

Warm-Up

1.

Wall – m	3	6	9	12	15	18	21	24						
Wallpaper lengths	2	4	6	8	10	12	14	16						

Mrs. Black used 16 lengths of wallpaper.

2.

Metres	100	150	200	250	300	350	400							
Markers	1	2	3	4	5	6	7							

William needed 7 markers.

3.

Days	1	2	3	4	5	6	7
# Pennies	1	2	4	8	16	32	64

Alexandra saved $1¢ + 2¢ + 4¢ + 8¢ + 16¢ + 32¢ + 64¢ = 127¢$ or \$1.27.

It's Your Turn

- A.
1. subtraction
 2. multiplication
 3. addition
 4. addition or multiplication
 5. division
 6. subtraction
- B.
1. multiplication— $40 \times 7 = 280$
 2. division— $60 \div 4 = 15$
 3. addition and subtraction— $5 + 10 + 10 + 20 = 45$ minutes to get ready
 $9:00 \text{ a.m.} - 45 \text{ minutes} = 8:15 \text{ a.m.}$



Lesson 4

Clarifying the Problem

Warm-Up

Answers will vary.

It's Your Turn

1. Bob is three years older than John and John is five years older than Bill. Peter is older than everyone and he is two years older than the next oldest person in the group. If Peter is 12 years old, how old are the other boys in the group?

Peter is the oldest so the order of ages from oldest to youngest is:

Peter, Bob, John, and Bill.

Peter's age = 12 years

Bob is 2 years younger than Peter so

Bob's age = $(12 - 2) = 10$ years old

John is 3 years younger than Bob so

John's age = $(10 - 3) = 7$ years old

Bill is 5 years younger than John so

Bill's age = $(7 - 5) = 2$ years old

2. Brian and his family do a lot of travelling. To serve as reminders of his trips Brian collects bumper stickers from everywhere they go. He has twelve stickers from places in Canada, sixteen from the United States, twenty-one from places in Europe and eighteen from places around the Orient. How many stickers does he have altogether and how many of those are from places outside North America?

Stickers from Canada = 12

Stickers from the United States = 16

Stickers from Europe = 21

Stickers from the Orient = 18

Total number of stickers = $(12 + 16 + 21 + 18) = 67$

Number of stickers from places outside North America =
 $[21(\text{Europe}) + 18(\text{Orient})] = 39$

Brian has 67 bumper stickers altogether and 39 of these are from outside North America.



Lesson 5

Too Many or Too Few Facts in Problems

Warm-Up

1. B
A large vinegar bottle holds 125 mL more than a small vinegar bottle.
2. A
A large ketchup bottle holds 250 mL more than a large vinegar bottle.
3. D
A small vinegar bottle holds 125 mL more than a small ketchup bottle.
4. C
A small and a large ketchup bottle hold 1000 mL together.

It's Your Turn

- A. 1. \$250 for a sun roof
 2. \$10 out of the bank
 3. 2000 spectators
- B. 1. How many issues make up a yearly subscription?
 2. How many award ribbons are to be made?
- C. 1.
$$\begin{array}{r} \$95 \\ \times 5 \\ \hline \end{array}$$
 \$475 Mr. Davis spent \$475 on the new tires.
2.
$$\begin{array}{r} \$.35 \\ \times 40 \\ \hline \end{array}$$
 \$14.00 Jim made \$14.00 on the lemonade.
3.
$$\begin{array}{r} 12 \\ \times 6 \\ \hline \end{array}$$
 72 There were 72 skaters in the show.
- D. The number of neon tetras = 6
 The number English guppies = 12
 The number of angel fish = 4
 The number of swordtails = 14
 The total number of fish that he could name
 $= (6 + 12 + 4 + 14) = 36$
 Mark had a total of 36 fish that he could identify by name.



Lesson 6

Eliminating Possibilities

Warm-Up

1. 14, 35, 7, ~~21~~, ~~49~~, 70 (The set is multiples of 7.)
2. 2, ~~8~~, 10, ~~12~~, 16 (The set is even numbers.)
3. 100, ~~10~~, 200, 500, 800, ~~400~~, 700 (The set is multiples of 100.)
4. ~~3~~, 24, 30, 9, ~~12~~ (The set is divisible by 3.)

It's Your Turn

- A.
 1. Clue #1: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
 Clue #2: Remaining numbers—5 10 15
 Clue #3: Remaining number—5
 2. Clue #1: 31 32 33 34 35 36 37 38 39
 Clue #2: Remaining numbers—31 33 35 37 39
 Clue #3: Remaining number—33
- B.
 1. Lowest score: 3 (3 darts in 1)
 Highest score: 15 (3 darts in 5)
 2. Possibilities:
 3 (1, 1, 1)
 5 (1, 1, 3)
 7 (1, 3, 3) (1, 1, 5)
 9 (3, 3, 3) (1, 3, 5)
 11 (1, 5, 5) (5, 3, 3)
 13 (3, 5, 5)
 15 (5, 5, 5)



Lesson 7

Using “Guess and Test” Techniques

Warm Up

1. a. 130, 155, 181, 208 (pattern—add 20, 21, 22, 23, 24, etc.)

 b. 394, 395, 402, 396 (pattern—add 1 to numbers in first, third, fifth, etc., positions and add 1 to numbers in second, fourth, sixth, etc., positions) * also works as +7, -6, +7, -6

2. $12 - 4 = 8$

 $6 - 3 = 3$

 Maryanne had 8 tees and 3 golf balls left.

3. a. d

 There are 62 bones in the skull and backbone.

 b. c

 There are 821 bones and muscles in the adult human body.

 c. b

 There are 409 more muscles than bones in the adult human body.

 d. a

 There are 4 more bones in the backbone than the skull.

It's Your Turn

1. $13 + 13$

 $12 + 14$ —Difference of 2.

 $11 + 15$

 $10 + 16$ The numbers are 12 and 14.

 $9 + 17$

 $8 + 18$

2.	Cows (4—# of legs)	Chickens (2—# of legs)	Animals	Legs
	1 (4)	11 (22)	12	26
	2 (8)	10 (20)	12	28
	3 (12)	9 (18)	12	30
	4 (16)	8 (16)	12	32
	5 (20)	7 (14)	12	34
	6 (24)	6 (12)	12	36
	7 (28)	5 (10)	12	38
	8 (32)	4 (8)	12	40

There were 8 cows and 4 chickens.

3.

8	2	5	3	18 (+ 4)
4	7	9	2	22
3	10	9	4	26 (-4)

Row Totals: 22



Lesson 8 Estimating Answers to Problems

Warm Up

1. $15 + 12$
2. 4×9

It's Your Turn

1. b. 80 kg
2. c. \$400
3. b. \$107.88
4. c. \$225
5. b. 15 L
6. b. \$134.25

- B.
1. $450 + 410 + 660 = 1520$ km
 2. $20 \times 20 = 400$ pages
 3. $300 \div 3 = 100$ cards
- C.
1. 6 kilograms
 2. 75 years
 3. 100 floors
 4. 40 000 km



Lesson 9

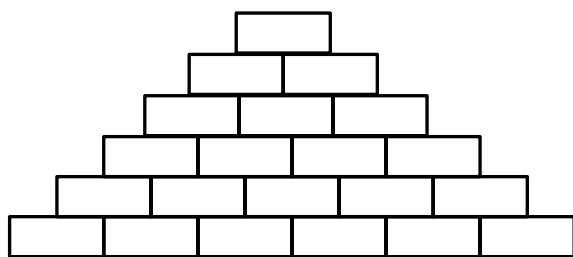
Problem Solving: Diagrams

Warm-Up

- A. Answers may vary.
1. 6, 7, 3 or 5, 7, 4
 2. 5, 4, 2 or 7, 3, 1
 3. 6, 7, 2 or 5, 4, 6
 4. 6, 5, 2 or 7, 5, 1
- B.
1. 3 chairs, 3 stools
 2. 6 tables, 2 stools
 3. answers may vary

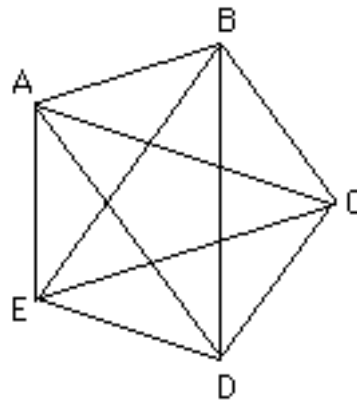
It's Your Turn

1.



blocks in the pyramid

21



2. 10 canals

$$\begin{array}{r} 3\text{ m} \quad 3\text{ m} \quad 3\text{ m} \quad 3\text{ m} \quad 3\text{ m} \quad 3\text{ m} \\ \hline 4\text{ m} \quad 4\text{ m} \quad 4\text{ m} \quad 4\text{ m} \quad 4\text{ m} \quad 4\text{ m} \end{array} \quad \begin{array}{r} 3\text{ m} = 18\text{ m} \\ + 20\text{ m} \\ \hline 38\text{ m} \end{array}$$



Lesson 10 Looking for Patterns

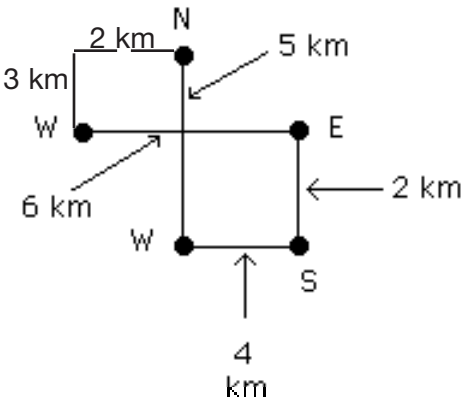
Warm-Up

1.

Orange	Green	Pink	Blue
G	P	B	
P	B		
B			

6 colour combinations

2.



He must go south for 3 km, then west for 2 km.
He must go west for 2 km, then south for 3 km.

It's Your Turn

- A.
1. 3, 6, 9, 15, 18, 21 (add 3)
 2. 1, 5, 9, 13, 17, 21, 25 (add 4)
 3. 480, 240, 120, 60, 30, 15 (half of previous number)

B.

4	5	6	7	8
\$18.00	\$22.50	\$27.00	\$31.50	\$36.00

or $8 \times 4.50 = \$36.00$

Mike earns \$30.00 in eight days.

C. 10 pieces



Lesson 11 Problem Solving: Organizing Data

Warm-Up

1. 
2. 
3. 
4. 

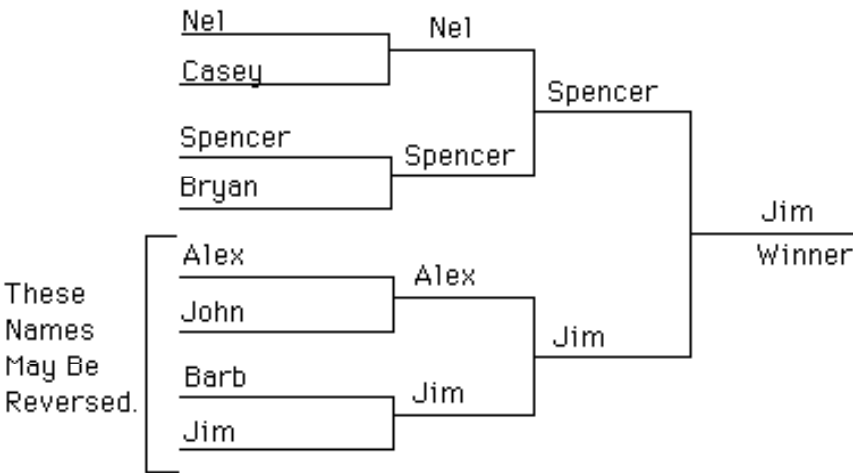
It's Your Turn

1.

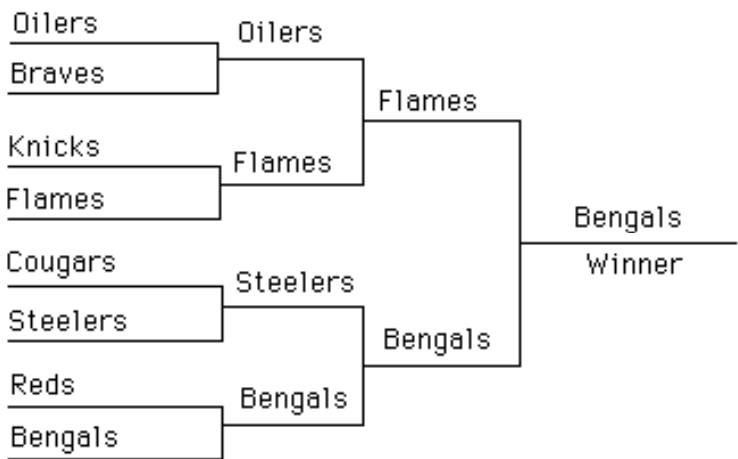
5¢		10¢		Total
Amount	Value	Amount	Value	
1	5¢	3	30¢	35¢
2	10¢	6	60¢	70¢
3	15¢	9	90¢	\$1.05
4	20¢	12	120¢	\$1.40
5	25¢	15	150¢	\$1.75
6	30¢	18	180¢	\$2.10

Chris must have 6 nickels in his pocket.

2.



3. Answers may vary slightly in the first round only.



The Bengals won the tournament.



Lesson 12

Multi-step Problems

Warm-Up

Pant Colour	+	Sweater Colour
red		white
red		blue
red		orange
black		white
black		blue
black		orange

Jill can wear 6 different outfits.

It's Your Turn

1. Step 1:
$$\begin{array}{r} \$4.25 \\ +2.50 \\ \hline \$6.75 \end{array}$$

Step 2:
$$\begin{array}{r} \$10.00 \\ -6.75 \\ \hline \$3.25 \end{array}$$

Statement: Louise has \$3.25 left.

2. Step 1:
$$\begin{array}{r} 15 \\ 5 \overline{)75} \end{array}$$

Step 2:
$$\begin{array}{r} \$15 \\ +16 \\ \hline \$31 \end{array}$$

Statement: Wes earned \$31.00.

$$\begin{array}{r} 3. \quad \begin{array}{r} 148 \\ - 64 \\ \hline 84 \end{array} \quad \begin{array}{r} 84 \\ - 64 \\ \hline 20 \end{array} \end{array}$$

He watched 20 more minutes on Tuesday.

$$\begin{array}{r} 4. \quad \begin{array}{r} 27 \\ 62 \\ + 59 \\ \hline 148 \end{array} \quad \begin{array}{r} 148 \\ \times 4 \\ \hline \$592 \end{array} \quad \text{or} \quad \begin{array}{l} 27 \times \$4 = \$108 \\ 62 \times \$4 = \$248 \\ 59 \times \$4 = \$236 \\ \$108 + \$248 + \$236 = \$592 \end{array}$$

\$592 was earned at the car wash.



Lesson 13 Logical Thinking

Warm-Up

$$\begin{array}{r} 1. \quad \begin{array}{r} \$ 1.25 \\ \times 9 \\ \hline \$11.25 \end{array} \quad \begin{array}{r} \$20.00 \\ - 11.25 \\ \hline \$8.75 \end{array} \end{array}$$

Suzanne had \$8.75 in change.

$$2. \quad 5 \times 4 = 20 \text{ hours a week}$$

$$\begin{array}{r} 20 \\ \times \$5 \\ \hline \$100 \end{array} \quad \begin{array}{r} \$6 \\ \times \$5 \\ \hline \$30 \end{array} \quad \begin{array}{r} \$100 \\ + \$30 \\ \hline \$130 \end{array}$$

Marie earns \$130 each week.

It's Your Turn

A.

	Fran	Jack
Canary	X	✓
Goldfish	✓	X

Fran has a goldfish and Jack has a canary.

- B. 1. 4
 2. 1
 3. no
 4. Short with brown hair
- C. 2 skateboards and 1 chair = 5 skateboards
 $(2 \times 4 \text{ kg}) + 1 \text{ chair} = 5 \times 4 \text{ kg}$
 $8 \text{ kg} + 1 \text{ chair} = 20 \text{ kg}$
 $1 \text{ chair} = 20 \text{ kg} - 8 \text{ kg}$
 $1 \text{ chair} = 12 \text{ kg}$

The chair must weigh 12 kg.



Lesson 14

Problems: Mass and Capacity

Warm-Up

- A. 1. Add 10, 20, 30, 40, 50, and so on.

10	20	40	70	110	160	220	290	370	460
----	----	----	----	-----	-----	-----	-----	-----	-----

2. Add 7, subtract 9.

72	79	70	77	68	75	66	73	64	71
----	----	----	----	----	----	----	----	----	----

- B. 1.

	Things you can eat	Things you can't eat
Red	tomatoes apples watermelon strawberries	fire truck stop sign
Not red	chocolate potatoes pickles peanut butter cookies	grass

2.
 - a. 4
 - b. 5
 - c. 2

It's Your Turn

- A.
 1. \$1.78 $2 \times \$0.89 = \1.78
 2. \$3.90 $2 \times \$1.95 = \3.90
 3. \$2.50 $2 \times \$1.25 = \2.50
 4. \$18.00 $4 \times \$4.50 = \18.00
 5. \$7.20 $4 \times \$1.80 = \7.20

- B.
 1. 500 mL bottle = $\$1.05 \times 2 = \2.10 for 1 L
 1 L bottle = $\$1.90 = \1.90 for 1 L
 The 1 L bottle is a better buy.

 2. 400 mL = $\$1.60 = \$1.60 \div 4 = 40\text{¢}$ per 100 mL
 300 mL = $\$1.20 = \$1.20 \div 3 = 40\text{¢}$ per 100 mL
 Both cost exactly the same.

- C.
 1. Chocolate milk at $\$1.10$ for 500 mL $\rightarrow \$1.10 \times 2 =$
 $\$2.20$ for 1-L

 or
Chocolate milk at $\$2.15$ for 1 L $\rightarrow \$2.15$ for 1 L

 2. Pears at $\$3.30$ for 3 kg = $\$3.30$ for 3000 g
 or
Pears at 49¢ for 500 g $\rightarrow \$0.49 \times 6 = \2.94 for 3000 g



Lesson 15

Problems: Time and Temperature

Warm-Up

1. $2 \times 780 = 1560$ mL
 $1.5 \text{ L} = 1500$ mL
The jug is too small for both cans of juice.
2. $50 \times 12 = 600$ g
1 dozen eggs has a mass of 600 g.

It's Your Turn

Part A

1.
 - a. 26°C
 - b. 18°C
 - c. 23°C
 - d. 11°C
 - e. 13°C
 - f. 13°C
2. 21.9 degrees C or 22 degrees C

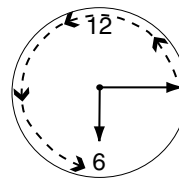
Part B

1.
 - a. 16:00
 - b. 10:00
 - c. 18:30
 - d. 20:15
 - e. 4:05
2.
 - a. completed
 - b. 8:00
 - c. 1:00 (remember, the clock only goes to 24, then starts again)
 - d. 14:00
 - e. 14:00

3. $1:15 \text{ p.m.} = 13:15 - 7 \text{ hours} = 6:15$

$6:15 - 45 \text{ minutes} = 5:30 \text{ a.m.}$

He began at 5:30 a.m.



Lesson 16

Problems Using Vertical and Horizontal Number Lines

Warm-Up

1.	22°	44°
	$\times 2^\circ$	$- 10^\circ$
	44° {combined temperatures	34°

The highest temperature was 34°C

2.

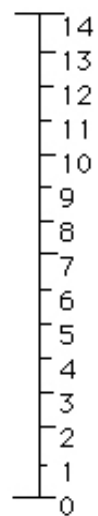
$1 \text{ h } 15 \text{ min}$
$+ 1 \text{ h } 45 \text{ min}$
$2 \text{ h } 60 \text{ min} = 3 \text{ hours}$

He played soccer for 3 hours.

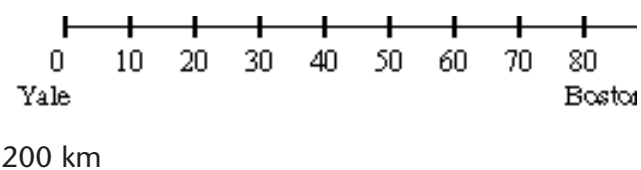
It's Your Turn

- A.
1. Vertical Number Line
Mountain climbing is an upward motion
 2. Horizontal Number Line
Land travel is a horizontal motion.

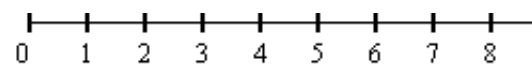
B. 1.
13th floor



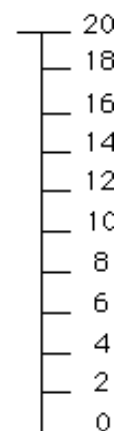
2.



C. 1.



2.

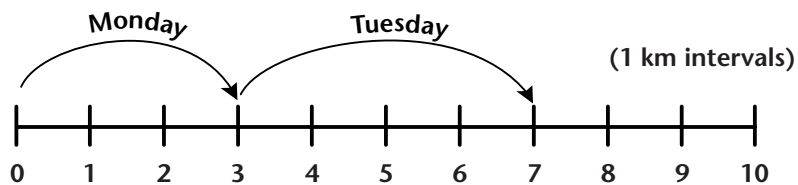




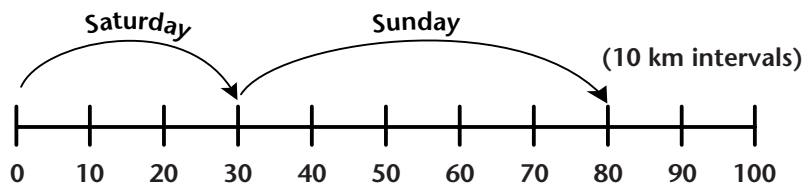
Lesson 17 Puzzle Problems

Warm-Up

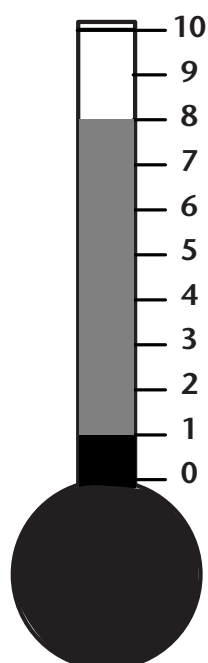
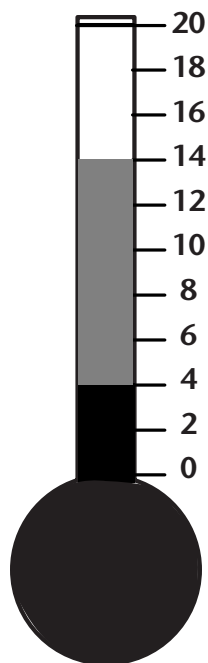
1. a.



b.



2.



2. a. Use 2°C intervals.

b. Use 1°C intervals.

It's Your Turn

A.

5	6	2	8	1	9	3	4	7
3	9	1	7	4	6	2	8	5
4	7	8	5	2	3	6	9	1
7	1	6	4	9	8	5	2	3
2	8	4	6	3	5	1	7	9
9	3	5	1	7	2	8	6	4
8	5	7	9	6	1	4	3	2
1	4	3	2	8	7	9	5	6
6	2	9	3	5	4	7	1	8

B. tricky

1. with
2. roar
3. dime
4. pace
5. cake
6. your

C.

1. cherry ferry
2. couch pouch
3. blue shoe
4. nickel pickle
5. loud crowd

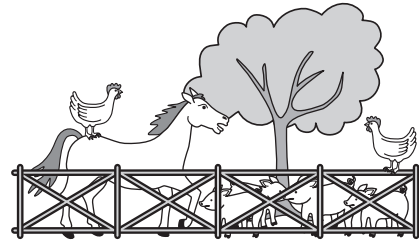
Mastery Test—Problem Solving

Answer Key

- A. Find the facts in the letter which answer the questions that follow the letter.

Dear Mom and Dad,

I arrived at cousin Leanne's farm last Thursday. She is 12 years old, 2 years older than I am. She has lots of pets—2 dogs, 3 cats, a duck, and a pony. I did not know that living on a farm was such hard work. Every day we get up at 5:30 and do chores. I gathered eggs—25 on Saturday, 20 on Sunday, and 20 on Monday. I also helped with feeding the 12 pigs. Do you know that pigs eat 2 kg of food daily?!



Uncle Ed has 2 cars and 2 trucks, plus a big machine called a thresher which he won't be using until September. Leanne's 3 brothers have to work hard with the other chores. Aunt Emma likes to bake bread and we helped her bake 9 loaves of bread today. This will last us a week.

Well, I have to go!

Love, Kate

1. How old is Kate? **10 years**
2. How many pets does Leanne have? (Do not include the pigs.) **7 pets**
3. On which day of the week were the most eggs gathered? **Saturday**
4. How much food do all the pigs eat each day? **24 kg**
5. How many children do Ed and Emma have? **4**
6. How many vehicles do Kate's uncle and aunt have? (Do not include the thresher.) **4**
7. How many days does the 9 loaves of bread last? **7 days**
8. How many people (adults and children) are on the farm? **7 people**

- B. Place your own numbers in the spaces in each problem, then solve the problem. Make sure you use numbers that are reasonable. (3 marks each)

Example:

Jack bought _____ pens which each cost _____¢. How much money did he spend?

Jack bought 4 pens which each cost 75¢. How much money did he spend?

$$\begin{array}{r} 2 \\ \$0.75 \end{array}$$

Show your work: $\frac{\times 3}{\$3.00}$ Statement: Jack spent \$3.00.

Paul is _____ cm tall. Bryan is _____ cm tall. How much taller is Bryan?
Show your work and write a statement.

Answers will vary

- C. Answer the following problems by deciding which numbers to use and what operation is needed. Then, circle the correct operation.

1. The local police department bought 3 new patrol cars. Each car needed to have flashing lights placed on the roof. A set of lights costs \$370 to install. How much would it cost to put the lights on the 3 cars?

$$\$370 \div 3$$

$$(\$370 \times 3)$$

$$\$370 - 3$$

2. The track and field stadium has 50 rows of seats on the east side and 70 rows of seats on the west side. How many rows of seats are there in all?

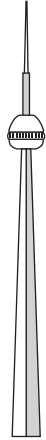
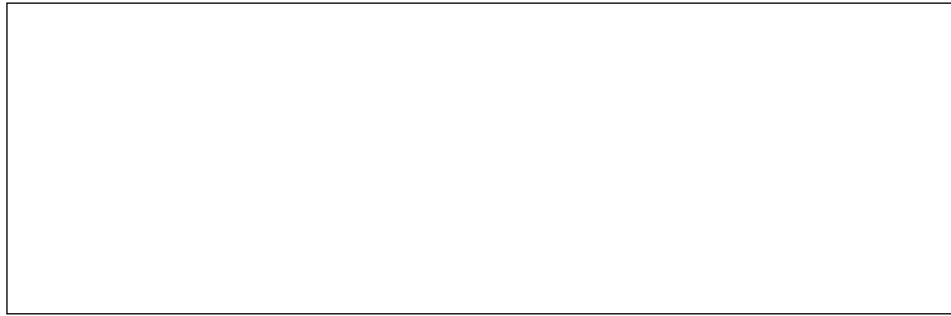
$$(50 + 70)$$

$$50 \times 70$$

$$70 - 50$$

- D. Answer the problem by reading the question carefully, planning what operation to use, and carrying out your plan. Write a concluding statement and think: **Is this reasonable?**

The CN Tower in Toronto is 555 m (metres) high. The Eiffel Tower in Paris is 320 m high. How much higher is the CN Tower than the Eiffel Tower?



Statement: **The CN Tower is 253 higher than the Eiffel Tower.**

- E. Read the following problem and underline what you think are the key words or parts in each. After that, put the information into number sentences and solve each problem.

Bob is three years older than John and John is five years older than Bill. Peter is older than everyone and he is two years older than the next oldest person in the group. If Peter is 15 years old, how old are the other boys in the group?

Bob is older than John and Bill, but John is older than Bill.

Peter is the oldest so the order of ages from oldest to youngest is: Peter, Bob, John, and Bill.

Peter's age = 15 years old

Bob is 2 years younger than Peter so Bob's age = $(15 - 2) = 13$ years old

John is 3 years younger than Bob so John's age = $(13 - 3) = 10$ years old

Bill is 5 years younger than John so Bill's age = $(10 - 5) = 5$ years old

- F. Solve each problem that has enough information. If facts are missing, write which facts are missing, but do not solve the problem. Show work in the box.

Example:

Jack bought some golf balls and received \$2 change from \$20. How many golf balls did Jack buy?

Missing Information: How much did each ball cost?

Kazz rides her bike 4 km to school each day. Yesterday, she rode her bike 1 km, then she realized she had forgotten her library book. Kazz went home, then rode to school. After school, she rode straight home. How far did Kazz ride her bike yesterday?



Statement: Kazz rode her bike 10 km yesterday.

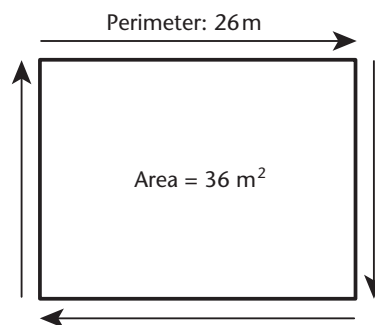
- G. Circle all of the unnecessary facts in the following problem.

Mrs. Smith looked at the apple selection at the store. Green apples were 98¢ per kg, red apples were \$1.25 per kg, and yellow apples were 69¢ per kg.

How much cheaper per kilogram were yellow apples than red apples?

H. Answer the problem using **guess and test** strategy.

1. *The area of a yard is 36 m^2 and the perimeter is 26 m . What is the length and width of the rectangular yard? (Area is the surface covering inside the yard. Perimeter is the distance around the yard.)*



Statement: **The length of the rectangular yard is 9 m and the width is 4 m.**

2. **How old am I?**

I am less than 15. **0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14**

I am an even number. **0, 2, 4, 6, 8, 10, 12, 14**

I have 2 digits. **10, 12, 14**

I am a multiple of 3. **12**

My age is **12**.

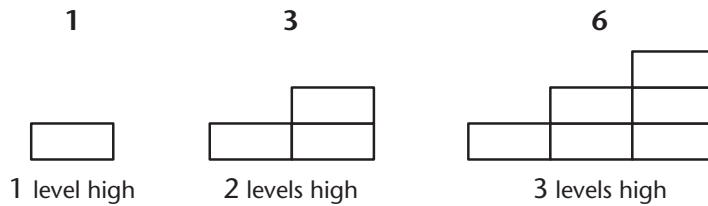
- I. Use the digits 9, 8, 7, 6 to make 2 addition equations each with a sum greater than 175.

$$\begin{array}{r} \square \square \\ + \square \square \\ \hline \square \square \square \end{array}$$

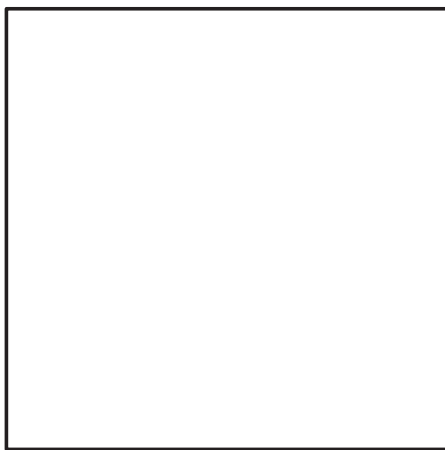
$$\begin{array}{r} \square \square \\ + \square \square \\ \hline \square \square \square \end{array}$$

Answers will vary.

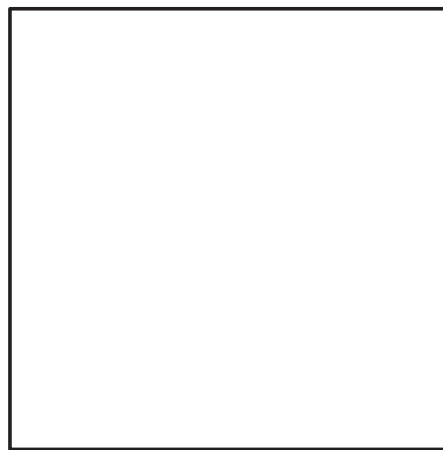
- J. How many blocks will be needed to complete the stairs so they are 6 levels high?



Draw the diagrams to find out how many blocks are needed for 4, 5, and 6 levels. Write the answer on the line provided.



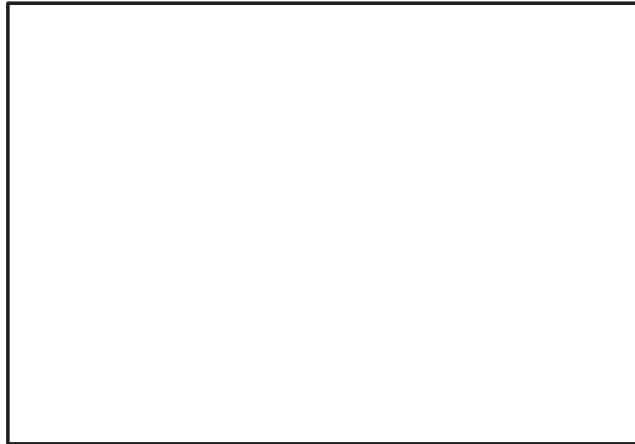
4 levels high = _____ blocks



5 levels high = _____ blocks

4 levels = 10 blocks

5 levels = 15 blocks



6 levels high = _____ blocks

6 levels = 21 blocks

- K. Solve the problem by showing your work in the box and writing a statement answer.

The photographer was taking photos of the children at Hilldale Elementary School and Bench Elementary School. He took 624 pictures on his first visit. How many more photos does he need to take if there are 306 students at Hilldale School and 357 students at Bench School?

Number of students = $306 + 357 = 663$

**Number of photos left to do = 663
 $\underline{- 624}$
 39**

Statement: The photographer needs to take 39 more photos.

- L. There were 4 transportation vehicles—a bike, a car, a bus, and a plane—at the airport. They were each a different colour: yellow, red, blue, or green. What colour was the car?

	Yellow	Red	Blue	Green
Bike	✗	✗	✗	✓
Car	✗	✓	✗	✗
Bus	✓	✗	✗	✗
Plane	✗	✗	✓	✗

Clues: The bus is yellow.

The bike was not red.

The plane's colour matched the colour of the sky.

Statement: **The car is red.**

- M. Solve the problem by using ✓ and ✗ to determine the answer.

Use the clues to determine which sport each girl plays.

	Golf	Baseball	Soccer
Marie	✗	✓	✓
Jennifer	✓	✗	✓
Fiona	✓	✗	✗

Marie doesn't like golfing. Jennifer can't play baseball because it is at the same time as soccer. Fiona doesn't like team sports.

Who plays soccer? **Jennifer and Marie**

Who plays golf? **Fiona and Jennifer**

Who plays baseball? **Marie**

N. Circle the best buy and show your work or explain your reasoning.

1. 500 g of roll-o-buds for \$1.45 $\rightarrow 2 \times 1.45$ for 1 kg
= \$2.90

or

1 kg of roll-o-buds for \$2.50

1 kg of roll-o-buds for \$2.50

2. 250 mL of root beer for 89¢ $\rightarrow 4 \times 0.89$ for 1 L
= \$3.54

or

1 L of root beer for \$3.80

250 mL of root beer for 89¢

O. Write the 24-hour time for each.

1. 18:00
2. 11:00
3. 14:30
4. 04:30
5. 22:00
6. 23:15

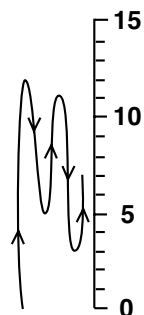
P. Complete the chart.

	Temperature	Change	New Temperature
1.	30°C	rise 17°C	47°C
2.	45°C	drop 27°C	18°C
3.	10°C	rise 14°C	24°C
4.	-10°C	rise 15°C	5°C
5.	-5°C	drop 7°C	-12°C

Q. Draw a number line to solve the problem. Write a statement answer.

A man entered the elevator on the main floor, went up 12 floors, then down 7 floors, up 6 floors, down 8 floors, and finally up 4 floors what floor did the man end up on?

Statement: **The man ended up on the 7th floor.**



R. Can you complete these Martian Math questions? The  means to multiply the first number by itself and then subtract the number.

$$9 \quad \text{Martian Math symbol} \quad 72$$

$$3 \quad \text{Martian Math symbol} \quad 6$$

$$7 \quad \text{Martian Math symbol} \quad 42$$

$$10 \quad \text{Martian Math symbol} \quad \underline{\quad 90 \quad}$$

$$8 \quad \text{Martian Math symbol} \quad \underline{\quad 56 \quad}$$

$$16 \quad \text{Martian Math symbol} \quad \underline{\quad 240 \quad}$$

$$30 \quad \text{Martian Math symbol} \quad \underline{\quad 870 \quad}$$



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