

Level 6

原版引进，英语能力自我挑战

快乐学数学，美式学习场景全体验

双语学习，更可助你迈出出国留学第一步

6 级

美国原版青少年核心能力拓展

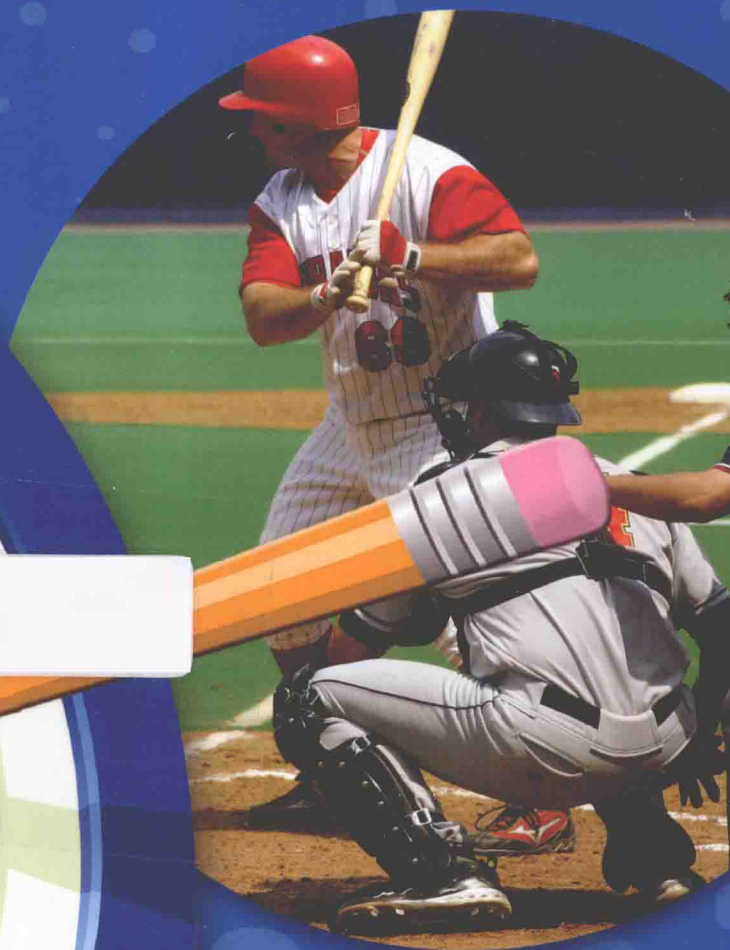
好玩的数学

Targeted Mathematics Student Guided Practice Book

主 编：〔美〕莎拉·约翰逊



Data Analysis and Probability
Number and Operations
Measurement
Geometry
Algebra



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Level 6

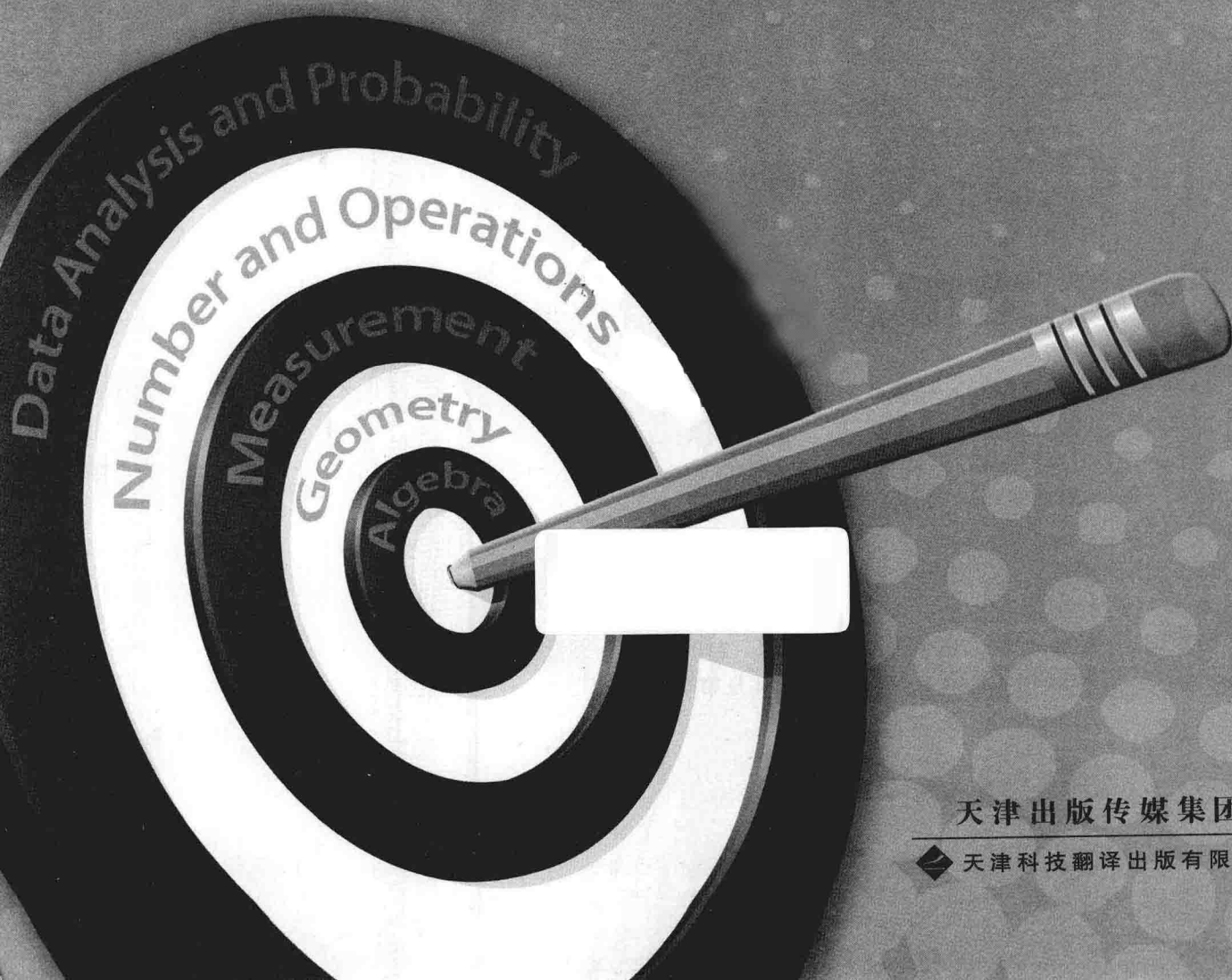
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编者前言

《美国原版青少年核心能力拓展:好玩的数学》(学前阶段及1~8级)是从美国教师创新教材出版公司(Teacher Created Materials Inc.)引进的现行介入式数学指南,全面反映了美国学前班至八年级数学课的现行教学内容及教学要求,同时也为我们展示了美国青少年丰富多彩、生动活泼的学习场景。

阅读使用这套丛书会让你有一种犹如在美国上学、与美国的小朋友同步学习的亲身体验。从中不仅可以了解美国学生在数学课上学些什么,做些什么样的作业,考些什么样的数学题;还可以知道他们的老师在课堂上讲些什么,以及对学生的要求是什么。由此你会发现,他们的数学课与我们的有相同之处,但也并非完全相同。我们侧重于背公式,做习题,备考应试;而他们侧重于理解和掌握数学的基础知识,既讲述初等数学的内容,又介绍了一些高等数学、数论、概率论、统计学的知识,并与其他学科相互联系,从而了解数学在其他学科中的应用,而且在教学中注意联系实际,注重实践应用,因此上数学课不会让学生感到枯燥乏味,而是感觉生动有趣。二者有着不同的教学理念和方式,如果能通过这套丛书的学习将二者有机地结合起来,取长补短,优势互补,必能开阔你的眼界,提高你对数学概念的理解,提升你的应用能力(当然也包括应试能力)。

数学是世界各地通用的一门学科,有着共同的概念、公式、术语、习题、计算方法,因此在这套书中有着非常熟悉的学习内容和知识背景:学过的数学知识,做过的数学学习题,考过的数学试题。特别之处在于这套丛书以英文原版形式体现,这就为你营造了一个在熟悉的背景下学习英语的环境,学会用地道的英语来表达学过的知识,表达真实的日常生活和学习活动,学会用英语和同学进行学习互动,从而大幅度提高你的英语水平。既学了数学又学了英语(而且是非常实用的英语),岂非两全其美的好事。

这套丛书适用于我国广大青少年读者,尤其是双语学校的学生以及打算到英语国家上高中、上大学的学生。学习这套丛书,就等于在国内体验了国外的学校生活,这对今后的深造无疑是大有裨益的。

打开书本,开启你在国内“留学”的全新生活吧!

英语就得天天练——阅读美国孩子的课余英文原版书

好玩的数学——体验美国青少年数学学习的乐趣

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Student Welcome Letter

欢迎信

Dear Student,

You are starting a program that will help you review math. Up to this point in school, you have learned many mathematical skills. This program will help you focus on what you already know how to do in math and what you need to learn. You will learn the important mathematical concepts, skills and vocabulary so that you are ready for next year.

Sometimes students have difficulty learning math. It can seem confusing. This program will help you practice math every day. You will review many concepts you learned in previous grades. Some of those concepts include probability, measuring angles, and problem solving.

Please sign the bottom of this letter. Signing will show that you are ready to learn and have fun!

Student Signature (学生签名)

Diagnostic Test

摸底测试

- 1** Which number is a factor (因数, 约数) of 45 and 72?

(A) 2
(B) 9
(C) 4
(D) 6

- 4** Monique's jump rope (绳) is 3.65 feet long. Mario's jump rope is 4.32 feet long. How much longer is Mario's jump rope than Monique's jump rope?

(F) 0.67 feet
(G) 7.97 feet
(H) 1.67 feet
(J) 1.33 feet

- 2** What is another way of expressing $\frac{21}{28}$?

(F) 0.7
(G) $\frac{3}{28}$
(H) 0.75
(J) $\frac{4}{3}$

- 5** Lara had 0.5 of a bag of crackers (饼干). She gave 0.3 of what she had to her friend Nicolas. How much of the total crackers did Nicolas get?

(A) 0.8 of the crackers
(B) 0.15 of the crackers
(C) 0.3 of the crackers
(D) 1.5 of the crackers

- 3** Kumar used 0.04 of a gallon* (加仑) of paint (涂料) to paint (用涂料涂) his bedroom. What is that number in percent (百分比) form?

(A) 4% (C) 400%
(B) 40% (D) 0.04%

- 6** Solve.

$$2\frac{5}{7} \div \frac{2}{3}$$

(F) $4\frac{2}{3}$
(G) $5\frac{1}{14}$
(H) $3\frac{8}{21}$
(J) $4\frac{1}{14}$

*为体现原版书的特色，书中出现的计量单位在不影响解题思路的情况下均保持原貌，个别在我国不常用的计量单位已做换算标注。计量单位换算可参见附录B：数学用表。

Diagnostic Test *(cont.)*

7 Solve.

$$6^3 =$$

- (A) 216
- (B) 18
- (C) 1,296
- (D) 7,776

10 Which expression shows 10 more than 8 times x ?

- (F) $8 \cdot 10$
- (G) $8x + 10$
- (H) $10 + x$
- (J) $8x - 10$

8 If $e = 2$ and $f = 8$,

$$6e + 2f =$$

- (F) $8ef$
- (G) 28
- (H) 52
- (J) 90

11 Solve.

$$7s = 84$$

- (A) $s = 12$
- (B) $s = 77$
- (C) $s = 588$
- (D) $s = 91$

9 Simplify.

$$2t + 3t(3 + t) + t$$

- (A) $12t$
- (B) $15t$
- (C) $3t^2 + 12t$
- (D) $9t + 3t^2$

12 Solve.

$$3c + 5 = 11$$

- (F) $c = 3$
- (G) $c = 18$
- (H) $c = 5\frac{1}{3}$
- (J) $c = 2$

Diagnostic Test (cont.)

- 13** Shanice is 7 years younger than her brother. If the sum of their ages is 31, how old is Shanice's brother?

(A) 13 years old
(B) 19 years old
(C) 23 years old
(D) 10 years old

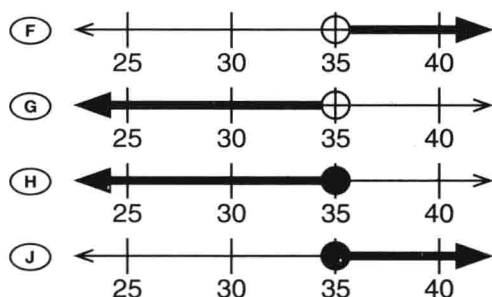
- 16** What type of triangle is this?



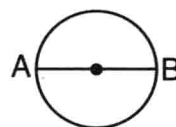
(F) scalene (不等边三角形)
(G) isosceles (等腰的)
(H) equilateral (等边的)
(J) right (直角的)

- 14** Which graph shows the solution to the inequality (不等式) below?

$$x - 7 \leq 28$$



- 17** What is the name for line segment (线段) \overline{AB} ?



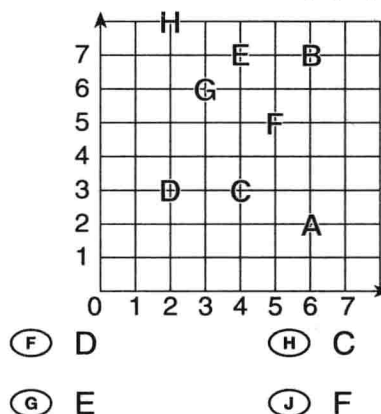
(A) circumference (周长)
(B) radius (半径)
(C) diameter (直径)
(D) side

- 15** What is the ratio (比率, 比例) of stars to squares?



(A) 7:5
(B) 5:7
(C) 7:12
(D) 12:7

- 18** Which letter is located at coordinates (坐标) (4, 3)?



Diagnostic Test (cont.)

- 19** The area (面积) of a rectangular (长方形) flag is 96 in.^2 . The perimeter (周长) is 40 inches. Which of the answers below shows a possible length and width of the flag?

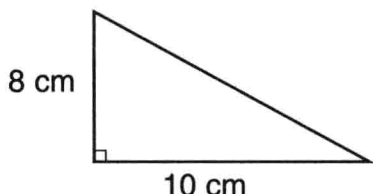
- (A) length = 12 inches
width = 8 inches
- (B) length = 10 inches
width = 10 inches
- (C) length = 13 inches
width = 7 inches
- (D) length = 14 inches
width = 8 inches

- 22** Petra's science experiment uses 16 pints (品脱) of vinegar (醋). How many gallons (加仑) does she need?

- (F) 4 gallons
- (G) 32 gallons
- (H) 2 gallons
- (J) 8 gallons

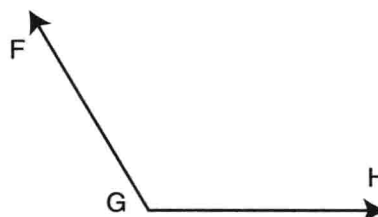
*本题单位换算参见附录B: 数学用表。

- 20** What is the area of the triangle below?



- (F) 80 cm^2
- (G) 14 cm^2
- (H) 28 cm^2
- (J) 40 cm^2

- 23** What is the approximate (估算的) measure of angle (角) FGH?



- (A) 120°
- (B) 60°
- (C) 45°
- (D) 145°

- 21** What is the volume (体积) of a rectangular prism (棱柱) with a length of 2.5 meters, a height of 9 meters, and a width of 10 meters?

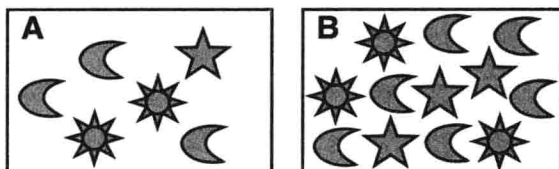
- (A) 21.5 meters cubed
- (B) 225 meters squared
- (C) 225 inches cubed
- (D) 225 meters cubed

- 24** Below are results recorded from a probability (概率) tree. Which letter shows ALL of the possible outcomes for flipping (掷) two coins?

- (F) (TT) (HH) (TH)
- (G) (TH) (HT)
- (H) (HH) (TT) (HT) (TH)
- (J) (HH) (TT)

Diagnostic Test (cont.)

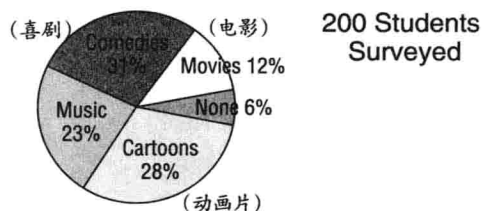
- 25** You have two boxes. What is the probability that you will pull (掏出) a sun out of both boxes?



- (A) $\frac{5}{18}$ (C) $\frac{1}{9}$
(B) $\frac{7}{12}$ (D) $\frac{1}{12}$

- 28** Use the circle graph (饼图) to determine how many students preferred (偏爱) music.

Favorite TV Shows



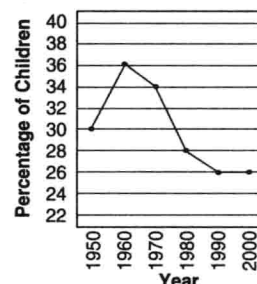
- (F) 32 students (H) 46 students
(G) 23 students (J) 28 students

- 26** The sixth-grade basketball team recorded these heights in inches: 66, 65, 59, 57, 60, 61, 67, 63, 62, 59, 63, 62. What is the mean (平均的) height of the basketball team?

- (F) 62 inches
(G) 60 inches
(H) 68 inches
(J) 64 inches

- 29** In which 10-year period (时期) did the greatest drop (下降) occur?

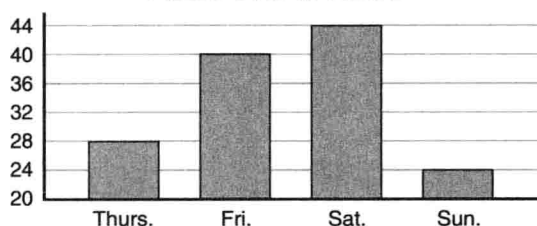
Population of Children in the U.S.



- (A) 1950–1960 (C) 1970–1980
(B) 1960–1970 (D) 1980–1990

- 27** How many pizzas did Jack sell (卖) altogether in the four days?

Pizzas Sold at Jack's



- (A) 100 pizzas (C) 142 pizzas
(B) 132 pizzas (D) 136 pizzas

- 30** Mr. Hernandez recorded his students' scores from their last math test in the stem-and-leaf plot (茎叶图) below. How many students scored over 80%?

6	8 9
7	3 5 7 7 9
8	1 2 3 5 5 5 8 8 8 9 9
9	0 1 2 5 5 6 7 7

- (F) 15 students (H) 19 students
(G) 11 students (J) 10 students

Lesson 1

It's a Fact! 这就是因数（约数）！

Directions: Complete the problems below.

1. Find all of the factors (因数) of these numbers.

a. 36 _____

b. 200 _____

2. Find the factors that these two numbers have in common (共同的).

a. 36 and 60 _____

b. 64 and 24 _____

3. Find the largest factor that these two numbers have in common.

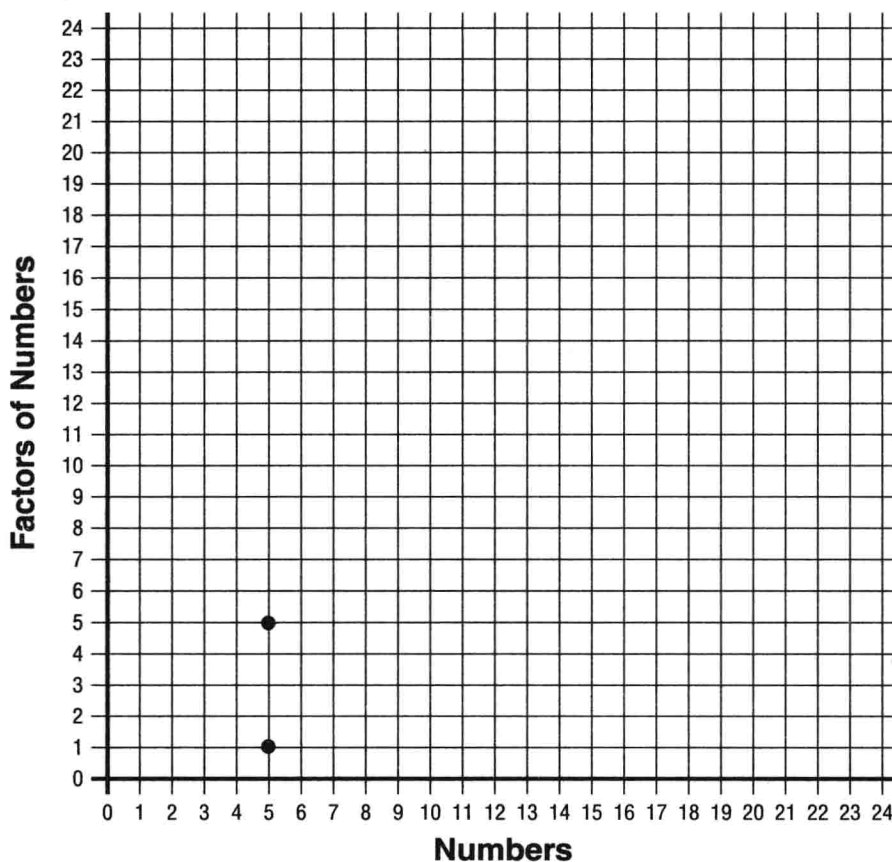
a. 20 and 25 _____

c. 6 and 21 _____

b. 12 and 60 _____

d. 49 and 14 _____

4. Mark a dot on the graph below where each of the numbers from 1–24 has a factor (在下表中用圆点标出1–24的因数). The number 5 has been done for you. It is a prime number (质数), so the only factors are 1 and 5.



a. Which number has the most factors? _____

b. Use the graph to find the common factors (公因数) for 8, 12, and 16. _____

c. Find the greatest common factor (最大公因数) of 6, 12, and 24. _____

We're Talking Telephone Numbers

说说电话号码

Directions: Write your school's telephone number on the lines below.

_____ - _____



1. Find the sum (总数) of the digits. Is this number a multiple (倍数) of 2, 4, 5, 10, or 100? Show your work here.

2. Write your home telephone number below. Find the sum of the digits in your home telephone number. Then, add it to the sum of the school's number. Is this new number a multiple of 2, 4, 5, 10, or 100? Show your work here.

3. John wrote his friend's telephone number on a scrap (碎片) of paper, but it got torn (撕开) and smudged (弄脏). He knows that it was a seven-digit number (七位数字) and that it was a multiple of 2, 4, 5, 10, and 100. Can you suggest what the number was?



4. Find two other seven-digit telephone numbers that are multiples of 2, 4, 5, 10, and 100.

Challenge

Find a seven-digit telephone number where the sum of its digits is divisible (可整除的) by 2, 4, 5, and 10.

Using Simpler Numbers

简化数字解题

Sometimes, a problem can seem too difficult to solve. If it has large numbers or complicated (复杂的) number concepts (概念), you can use simpler numbers to help you understand what you need to do. Then, you'll be ready to tackle (处理) the harder problem!

Using simpler numbers can help in several (几种) ways. It can help you understand what operations (运算) you need to use to solve the problem. Try replacing (替换) the large numbers in the problem with smaller numbers. Then, solve the problem. If the answer makes sense (有意义) for the smaller numbers, then you can use the same operations with the larger numbers.

Another way to use simpler numbers is to break down (分解) the problem into smaller parts. As you solve each part, keep track of (记录) your answers by drawing pictures or a table. Soon, you may see a pattern (规律) that will help you solve the big problem.

Problem: Painting (粉刷) Houses

The Problem

One day, 8 painters worked 12 hours each to finish painting half of the outside of a house. Only 4 of the painters plan to stay to finish the other half of the house. How long will it take the 4 painters to complete the other half?

Understanding the Problem

- *What do we know?*

Eight painters each worked 12 hours to paint half a house. And, 4 painters will finish painting the other half.

- *What do we need to find out?*

How long it will take for the 4 painters to complete the other half.

Planning and Communicating a Solution

- *Start with a Simpler Example*

If it takes 4 painters 4 hours to paint half of the outside of a house, how long will it take 2 painters to paint the other half?

First, find out how long it would take 1 painter to paint the outside of half the house alone. He would have to

work 4 times longer to do the job of the original (原先的) 4 painters, so he would take 16 hours.

$$4 \times 4 = 16 \text{ hours}$$

If 2 painters work on the other half, each will only have to work half as much time as 1 painter.

So, it would take them 8 hours to paint the other half of the house.

$$16 \div 2 = 8 \text{ hours}$$

- *Solve the Original Problem*

Start by working out how long it will take 1 painter to complete the work. We know that 8 painters take 12 hours, so 1 painter would have to work 8 times longer to do the job of 8 painters. So, 1 painter would take 96 hours.

$$8 \times 12 = 96 \text{ hours}$$

If 4 painters work on the other half, they would each have to work only $\frac{1}{4}$ as much time as 1 painter.

- *Do you see the answer?*

$$96 \div 4 = 24 \text{ hours}$$

They would each work 24 hours.

Reflecting and Generalizing

By starting with a simpler example, you are able to solve the problem more easily.