

國立中央大學

數學研究所

碩士論文

臺灣及美國數學教科書

比例單元之內容分析

Content Analysis of Proportion in Taiwanese and American
Mathematics Textbooks

附錄一

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中華民國 113 年 7 月

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美國六年級教學例

編碼：6-2-1-1

榨汁機可容納 120 杯果汁。榨汁機中大約有多少部分充滿了果汁？大約還需要多少杯果汁才能裝滿榨汁機？**個人情境**

The juice dispenser holds 120 cups of juice. About **what** fraction of the dispenser is filled with juice? About how many more cups of juice would it take to fill the dispenser?



編碼：6-2-1-2

格里芬同年兩次去加拿大看望她的祖父。格里芬說每天溫度的絕對值為10。這兩個溫度之間的差異可能是多少度？**個人情境**

Griffin visited her grandfather in Canada twice in the same year. Griffin says the absolute value of the temperature each day was 10. **What** could be the difference between the two temperatures in degrees?



編碼：6-2-1-3

一項調查詢問了人們的身體特徵。在接受調查的 30 人中，有 7 人表示自己有捲髮。接受調查的人中有多少是捲髮？**科學情境**

A survey asked people about their physical characteristics. Out of the 30 people surveyed, 7 people reported having curly hair. **What** percent of the people surveyed have curly hair?



編碼：6-2-1-4

一所中學的學生正在組織三個籌款項目來籌集資金。八年級會賣日曆。七年級將賣爆米花。六年級會賣海報。

每個年級為其籌款活動選擇不同的目標。三個年級相互競爭，看哪個年級先達到募款目標。每個年級的募款目標都顯示在校長辦公室前的橫幅上。

您如何比較各年級的募款目標？**社會情境**

Students at a middle school are organizing three fundraising projects to raise money. The eighth grade will sell calendars. The seventh grade will sell popcorn. The sixth grade will sell posters.

Each grade picks a different goal for its fundraiser. The three grades are competing to see which grade will reach its fundraising goal first.

The fundraising goal for each grade is displayed on a banner in front of the principal's office.



Grade	Fundraising Goal
6th grade	\$ 300
7th grade	\$ 450
8th grade	\$ 150

- How can you compare the grades' fundraising goals?

編碼：6-2-1-5(A)

一所中學的學生正在組織三個籌款項目來籌集資金。八年級會賣日曆。七年級會賣爆米花。六年級會賣海報。每個年級為其籌款活動選擇不同的目標。三個等級分別是比賽看哪個年級最先達到籌款目標。每個年級的籌款目標都顯示在校長辦公室前的橫幅上。(如下圖所示)

(A) 學生們在紙條上寫下了一些關於籌款目標的聲明，並交給校長在早上的公告中通過擴音器宣讀。確定每項主張是否屬實。解釋你的推理。

社會情境

馬庫斯：六年級的目標比八年級的目標多 150 美元。

Kimi：當六年級學生達到他們的目標時，他們將提高 $\frac{2}{3}$ 七年級的目標。

拉基莎：八年級目標是六年級目標的一半。

安德烈斯：八年級學生計劃每籌集一美元，六年級學生計劃籌集兩美元。

ben：六年級學生每計劃籌集 60 美元，七年級學生計劃籌集 90 美元。

伊麗莎：六年級目標是八年級目標的 200%。

chung：八年級每計劃籌集 3 美元，七年級計劃籌集 1 美元。

- A** The students wrote some claims about the fundraising goals on slips of paper and gave them to the principal to read over the loudspeaker during the morning announcements. Decide whether each claim is true. Explain your reasoning.

Markus:
The sixth-grade goal is \$150 more than the eighth-grade goal.

Kimi:
When the sixth graders meet their goal, they will have raised $\frac{2}{3}$ of the seventh-grade goal.

Lakisha:
The eighth-grade goal is half the sixth-grade goal.

Andres:
For every dollar the eighth graders plan to raise, the sixth graders plan to raise two dollars.

Ben:
For every \$60 the sixth graders plan to raise, the seventh graders plan to raise \$90.

Eliza:
The sixth-grade goal is 200% of the eighth-grade goal.

Chung:
For every \$3 the eighth grade plans to raise, the seventh grade plans to raise \$1.

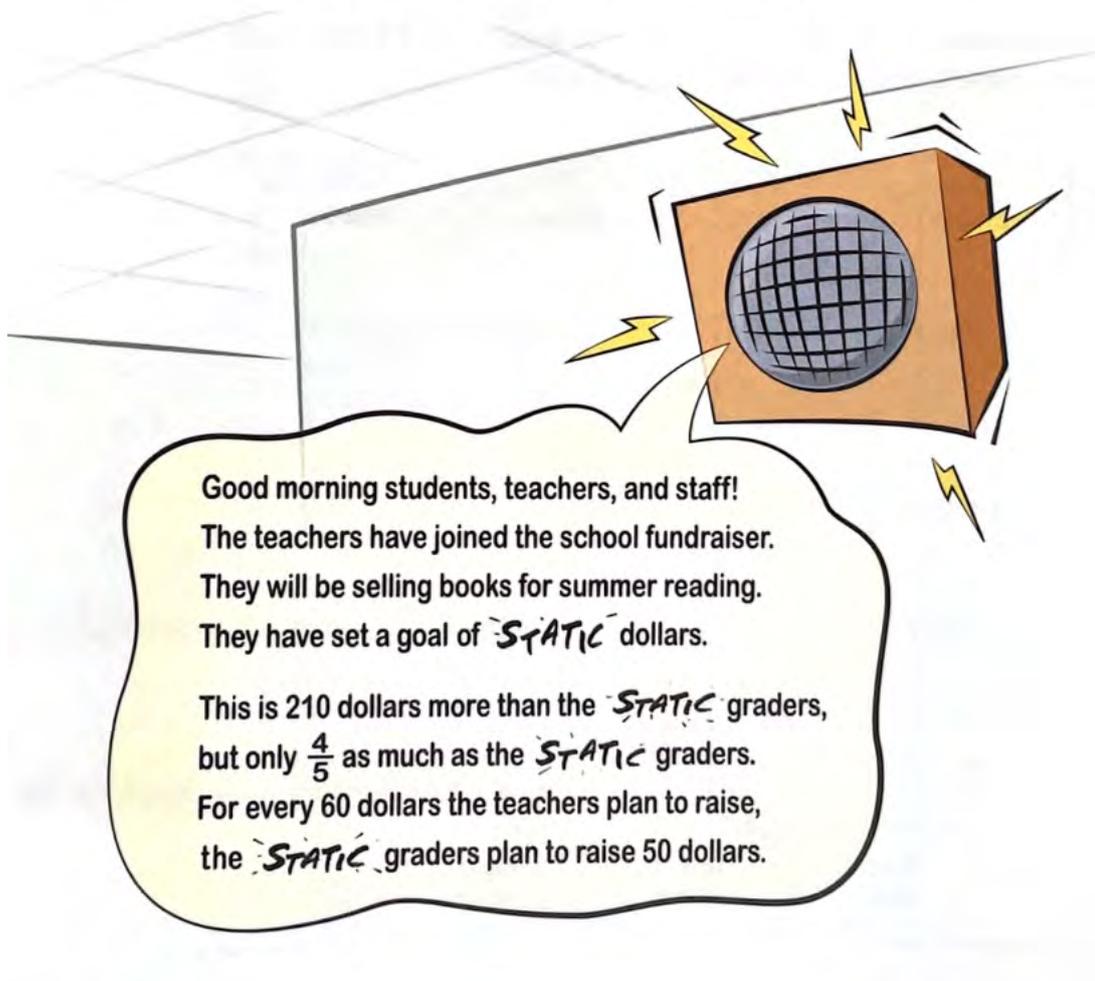
編碼：6-2-1-5(B, C)

(B)再寫三個真實的比較陳述，讓校長通過揚聲器宣讀。社會情境

(C)籌款活動第一天，校長通過擴音器宣布了又一個目標—教師們的籌款目標。麥克風工作得不太好。您認為老師們的目標是什麼？社會情境

各位同學、老師、工作人員大家早上好！老師們參加了學校的籌款活動。他們將出售夏季閱讀的書籍。他們設定了---美元的目標。這比---多 210 美元，但僅 $\frac{4}{5}$ 與---一樣多。教師計劃每籌集 60 美元，---年級計劃籌集 50 美元。

- B** Write three more true comparison statements for the principal to read over the loudspeaker.
- C** On the first day of the fundraiser, the principal announces one more goal over the loudspeaker—the teachers' fundraising goal. The microphone is not working very well. What do you think the teachers' goal is?



編碼：6-2-1-6

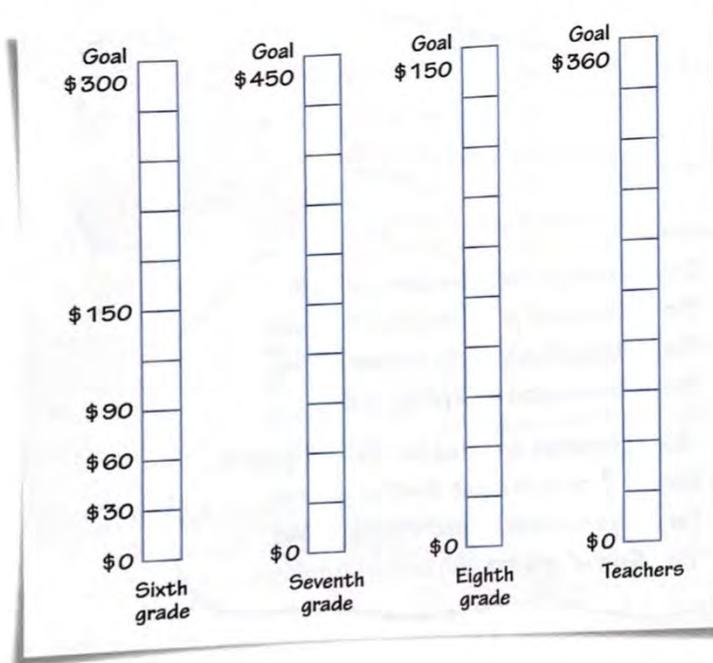
中學校長在看起來像溫度計的圖表上顯示了每個年級的籌款進度。校長使用分數和金額來記錄溫度計上顯示的進度。籌款活動為期 10 天。每天，校長都會透過擴音器宣布每個年級的進展。

儘管目標不同，但溫度計的長度始終相同。每個溫度計分為 10 等份。

(翻譯問題)如何使用溫度計在目標之中進行比較？社會情境

The principal at the middle school shows each grade's fundraising progress on charts that look like thermometers. The principal records the progress shown on the thermometer using fractions and dollar amounts. The fundraiser lasts 10 days. Each day, the principal announces the progress of each grade over the loudspeaker.

The thermometers are all the same length, despite the different goals. Each thermometer is subdivided into 10 equal parts.



- How can you use the thermometers to make comparisons among the goals?

編碼：6-2-1-7(A, B1, B2, C1, C2, D1, D2)

中學校長在看起來像溫度計的圖表上顯示了每個年級的籌款進度。校長使用分數和美元金額記錄溫度計上顯示的進度。籌款活動持續 10 天。每天，校長都會通過擴音器宣布每個年級的進展情況。儘管目標不同，但溫度計的長度都相同。每個溫度計均分為 10 等份。

(如編碼：6-2-1-6 之圖示)

(A)校長在四個溫度計上的一些標記上標註了美元金額。決定其餘標記屬於哪些標記。社會情境

Ben 說：六年級學生每計劃籌集 60 美元，七年級學生計劃籌集 90 美元。他查看了校長的溫度計，發現六年級溫度計上的 60 美元與七年級溫度計上的 90 美元位於同一個位置。Ben 還提出了這樣的主張：六年級學生每計劃籌集 30 美元，七年級學生計劃籌集 45 美元。

(B1)你同意這個說法嗎？解釋你的推理。社會情境

(B2)使用溫度計為每項與籌款目標相關的主張再寫兩個。社會情境

您可以將問題 B 中的每個比較寫成比率。比率是一種比較。您可以通過以下兩方法重寫問題 B 中的比較。

六年級目標與七年級目標的比例為 60 比 90。

六年級目標與七年級目標的比例為 30 比 45。

(C1)每個比率語句中的數字 60、90、30 和 45 意味著什麼？社會情境

(C2)使用 ratio 重寫問題 B 第 2 部分中的比較。社會情境

(D1)Ben 陳述中的比率使用不同的數字顯示了相同的關係。這些比率是等價的。列出您在本問題中發現的其他一些等價比對。社會情境

(D2)您在比率中發現哪些模式可以幫助您找到其他等價比率？社會情境

- A** The principal labeled some of the marks on the four thermometers with dollar amounts. Decide what labels belong on the remaining marks.
- B** 1. Ben said: *For every \$60 the sixth graders plan to raise, the seventh graders plan to raise \$90.* He looks at the principal's thermometers and sees that \$60 is at the same place on the sixth-grade thermometer as \$90 is on the seventh-grade thermometer.
- Ben also makes the claim: *For every \$30 the sixth graders plan to raise, the seventh graders plan to raise \$45.*
- Do you agree with this claim? Explain your reasoning.
2. Use the thermometers to write two more *for every* claims that relate the fundraising goals.
- C** You can write each of the comparisons in Question B as a **ratio**. A **ratio** is a kind of comparison.
- Here are two ways that you can rewrite the comparisons in Question B.
- The ratio of the sixth-grade goal to the seventh-grade goal is 60 to 90.
- The ratio of the sixth-grade goal to the seventh-grade goal is 30 to 45.
1. What do the numbers 60, 90, 30, and 45 mean in each ratio statement?
2. Rewrite your comparisons from Question B part 2 using the word *ratio*.
- D** 1. The ratios from Ben's statements show the same relationship using different numbers. These ratios are *equivalent*. List some other pairs of equivalent ratios you have found in this Problem.
2. What patterns do you notice in your ratios that can help you find other equivalent ratios?

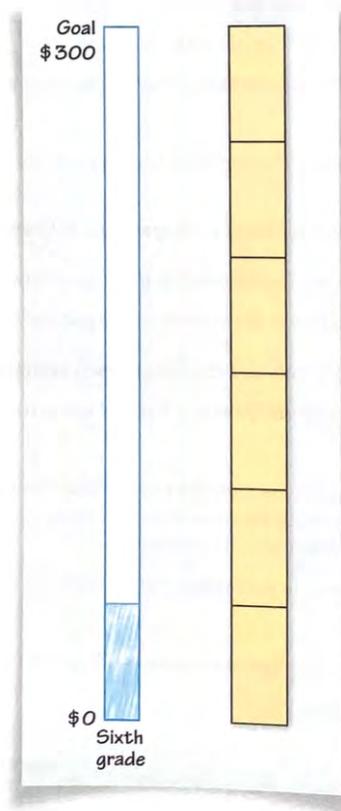
編碼：6-2-1-8(A, B)

六年級的學生製作了自己的籌款溫度計來記錄他們的進展。每天結束時，他們都會將籌集的總金額與目標進行比較。溫度計的陰影部分代表六年級學生達到的目標的分數。他們面臨的挑戰是弄清楚如何將美元金額表示為300美元的一小部分。他們製作分數條來幫助他們正確地遮蔽溫度計。

(A) 六年級學生收集的錢是否超過了他們的目標的 $\frac{1}{10}$ ？多於目標的 $\frac{2}{10}$ ？社會情境

(B) 溫度計顯示他們在第一天籌集的金額。他們籌集的資金佔目標的多少？社會情境

The sixth graders made their own fundraising thermometer to record their progress. At the end of each day, they compare the total amount they have raised to their goal. The shaded part of the thermometer represents the fraction of the goal the sixth graders have raised. Their challenge is to figure out how to represent dollar amounts as a fraction of \$300. They make fraction strips to help them correctly shade their thermometer.



- Have the sixth graders collected more than $\frac{1}{10}$ of their goal? More than $\frac{2}{10}$?
- The thermometer shows the amount they raised on Day 1. What fraction of their goal have they raised?

編碼：6-2-1-9(A1, A2, B1, B2, B3, B4)

使用 $8\frac{1}{2}$ 英寸長的紙條。每個條帶代表 1 個整體。折疊條帶以顯示一半、三分之一、四分之一、五分之一、六分之一、八分之一、九分之一、十分之一和十二分之一。

(A1) 標記摺痕，以便您可以輕鬆看到它們，如下所示。無情境

(A2) 使用 $8\frac{1}{2}$ 英寸長的紙條。每個條帶代表 1 個整體。折疊條帶以顯示一半、三分之一、四分之一、五分之一、六分之一、八分之一、九分之一、十分之一和十二分之一。標記摺痕，以便您可以輕鬆看到它們，如下所示。用什麼策略來折疊你的紙條？無情境

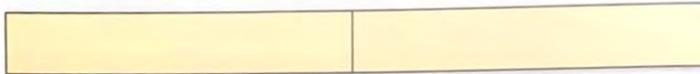
(B1) 如何用二分條折疊八分之一？無情境

(B2) 下圖顯示了學生的二分之一、四分之一和八分之一的紙條。一半條帶的一部分的大小與八分之一條帶的一部分的大小相比如何？無情境

(B3) 如果從三分條開始，您可以製作多少分數條？無情境

(B4) 折疊的分數條中哪一條至少有一個標記與十二分之一條上的標記對齊？紙條上的匹配標記表明什麼等值分數？無情境

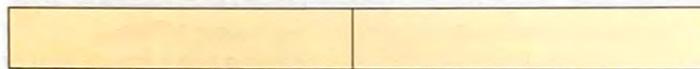
- A** 1. Use strips of paper $8\frac{1}{2}$ inches long. Each strip represents 1 whole. Fold the strips to show halves, thirds, fourths, fifths, sixths, eighths, ninths, tenths, and twelfths. Mark the folds so you can see them easily, as shown below.



2. What strategies did you use to fold your strips?

- B** 1. How can you use the halves strip to fold eighths?

2. The picture below shows a student's halves, fourths, and eighths strips. How does the size of one part of a halves strip compare to the size of one part of an eighths strip?



3. What fraction strips can you make if you start with a thirds strip?
4. Which of the fraction strips you folded have at least one mark that lines up with a mark on a twelfths strip? What equivalent fractions do the matching marks on the strips suggest?

編碼：6-2-1-9(C1a, C1b, C2)

早期年級，你使用使數軸（如下圖所示）來顯示整數。

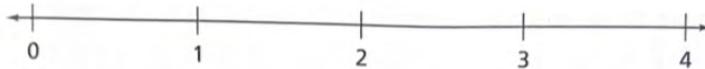
現在您可以使用分數條來標記整數之間的點。首先使用分數條在數字上標記 0 和 1 在你的紙上劃線。（如下圖所示）

(C1a) 一些學生開始用三分之一、六分之一、九分之一和十二分之一的分數條畫出數軸。該圖顯示了他們迄今為止的工作。一名學生使用頂部分數條在數軸上進行標記 $\frac{2}{3}$ 。（如下圖所示）無情境

(C1b) 說出此處顯示的其他三個等價的分數無情境

(C2) 如果您使用分數條來命名 0 之間和 1 在數軸上的特定点，如何找到等效的分數來命名這點？無情境

C In earlier grades, you used number lines, such as the one below, to show whole numbers.

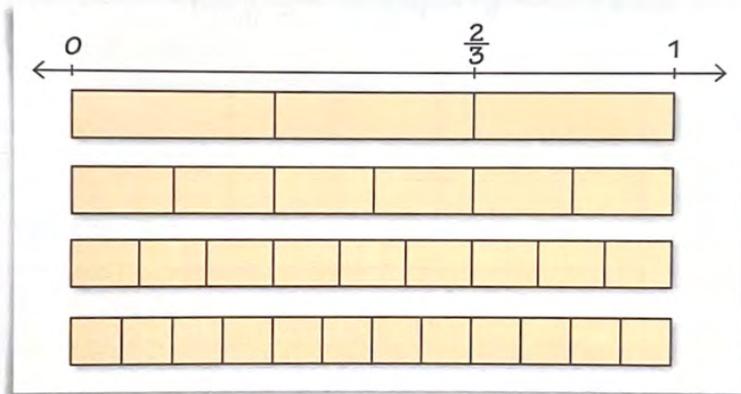


Now you can use fraction strips to mark points between whole numbers.

You start by using a fraction strip to mark and label 0 and 1 on a number line on your paper.



1. Some students began to make a number line using their one-third, one-sixth, one-ninth, and one-twelfth fraction strips. The drawing shows their work so far. One student used the top fraction strip to mark $\frac{2}{3}$ on the number line.



- a. Name three other fractions shown here that are equivalent to $\frac{2}{3}$.
 - b. Name another fraction equivalent to $\frac{2}{3}$.
2. If you have used a fraction strip to name a specific point between 0 and 1 on a number line, how can you find equivalent fractions to name this point?

編碼：6-2-1-9(D1, D2)

其他一些學生開始使用不同的分數條標記數字線。使用他們的繪圖來測量點之間的距離。例如，0 和 $\frac{3}{5}$ 的距離為 $\frac{3}{5}$ 。

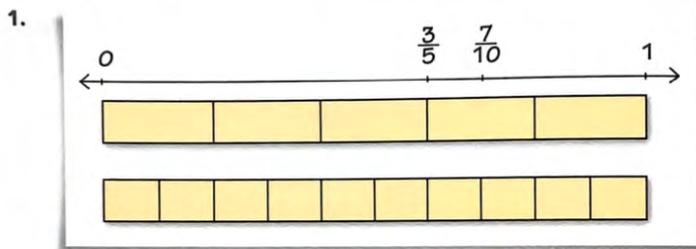
(D1) 每對點之間的距離是多少 無情境

- a. 0 和 $\frac{7}{10}$
- b. $\frac{3}{5}$ 和 $\frac{7}{10}$
- c. $\frac{7}{10}$ 和 1
- d. $\frac{3}{5}$ 和 1

(D2) 每對點之間的距離是多少 無情境

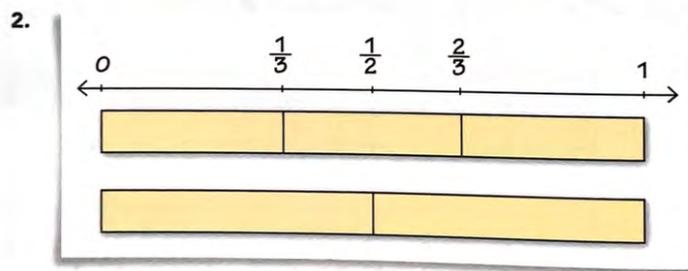
- a. 0 和 $\frac{1}{3}$
- b. $\frac{1}{3}$ 和 $\frac{1}{2}$
- c. $\frac{1}{3}$ 和 $\frac{2}{3}$
- d. $\frac{1}{2}$ 和 $\frac{2}{3}$
- e. $\frac{1}{2}$ 和 1
- f. $\frac{2}{3}$ 和 1

D Some other students began to mark a number line using different fraction strips. Use their drawings to measure distances between points. For example, the distance between the mark labeled 0 and the mark labeled $\frac{3}{5}$ is $\frac{3}{5}$.



What is the distance between each pair of points?

- a. 0 and $\frac{7}{10}$ b. $\frac{3}{5}$ and $\frac{7}{10}$ c. $\frac{7}{10}$ and 1 d. $\frac{3}{5}$ and 1



What is the distance between each pair of points?

- a. 0 and $\frac{1}{3}$ b. $\frac{1}{3}$ and $\frac{1}{2}$ c. $\frac{1}{3}$ and $\frac{2}{3}$
d. $\frac{1}{2}$ and $\frac{2}{3}$ e. $\frac{1}{2}$ and 1 f. $\frac{2}{3}$ and 1

編碼：6-2-1-9(E1, E2, E3, E4)

(E1) 說出 5 個與 $\frac{4}{12}$ 等價的分數。無情境

(E2) 說出 5 個接近但不等於 $\frac{4}{12}$ 的分數。無情境

(E3) 分數條、數軸和數字思考如何幫助你找到等值分數？無情境

(E4) 馬特聲稱 $\frac{1}{3}$ 可以指示數軸上的點以及距離。他說得對嗎？解釋。個人情境

- Ⓔ 1. Name five fractions equivalent to $\frac{4}{12}$.
2. Name five fractions that are near, but not equivalent to, $\frac{4}{12}$.
3. How can fraction strips, number lines, and thinking with numbers help you find equivalent fractions?
4. Matt claims that $\frac{1}{3}$ can indicate a point on a number line as well as distance. Is he correct? Explain.

編碼：6-2-1-10

以下是關於問題 1 中籌款目標的兩個說法。

Ben：每當六年級計劃籌集\$6時，七年級計劃籌集\$90。

Kimi：當六年級達到他們的目標時，他們將籌集到七年級目標的 $\frac{2}{3}$

Ben 和 Kimi 都在比較一個六年級目標與一個七年級目標。Ben 使用比例進行比較，而 Kimi 使用分數進行比較。

思考一下使用分數進行比較與使用比例進行比較的異同。

當你使用分數將部分與整體進行比較時，通常會有多種分數表示同一數量。例如，在問題 1.3 中，你發現了：

在接下來的問題中，你將使用分數比較年級的籌款進展與其籌款目標。

下一頁的溫度計顯示了六年級在 2、4、6、8 和 10 天後海報銷售的進展。

校長需要知道六年級在每一天後完成了目標的幾分之幾。

你如何使用分數條來衡量六年級的進展？**社會情境**

Here are two claims about the fundraising goals from Problem 1.1.

Ben:

For every \$60 the sixth graders plan to raise, the seventh graders plan to raise \$90.

Kimi:

When the sixth graders meet their goal, they will have raised $\frac{2}{3}$ of the seventh-grade goal.

Ben and Kimi are each comparing one sixth-grade goal to one seventh-grade goal. Ben uses ratios to make comparisons and Kimi uses fractions to make comparisons.

- Think about some ways in which working with fractions is like and not like working with ratios.

When you use fractions to compare a part to a whole, you often have more than one fraction name for the same quantity. For example, in Problem 1.3, you found that $\frac{1}{5} = \frac{2}{10}$.

In this next problem, you will compare the fundraising progress of a grade to its fundraising goal using fractions.

The thermometers on the next page show the progress of the sixth-grade poster sales after 2, 4, 6, 8, and 10 days. The principal needs to know what fraction of the goal the sixth grade has achieved after each day.

- How can you use your fraction strips to measure the sixth-grade's progress?

編碼：6-2-1-11(A, B, C1, C2, D1, D2, E1, E2)

檢查上一頁上的溫度計和分數條。(如下圖)

(A) 你如何判斷六年級學生每天籌集的金額是否相同？解釋之。社會情境

(B) 第二天後，六年級學生達到了目標的幾分之一？第四天？第六天？第八天？第十天？社會情境

(C1) 瑪麗用她的四等分紙條在右側的第二天溫度計上測量並標記分數和美元金額。她寫的美元金額正確嗎？你怎麼知道？社會情境

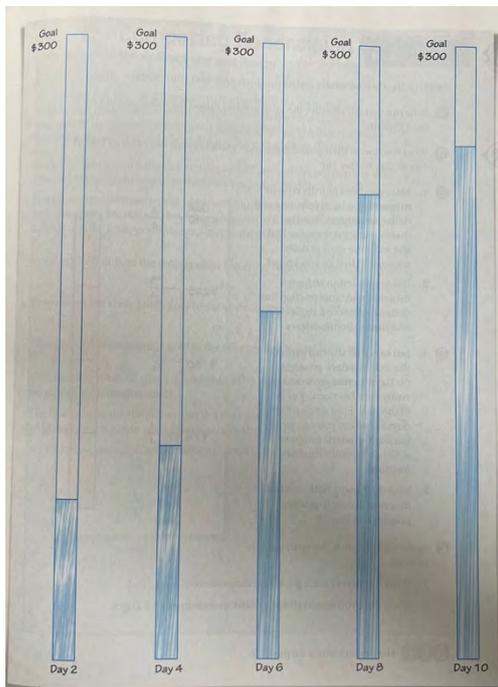
(C2) 使用分數條測量分數和美元金額，並在其餘溫度計的副本上標記分數和美元金額。社會情境

(D1) 傑里說，她可以使用等值分數以兩種方式表達六年級學生在第二天的目標：1/4 或 2/8。找一些其他日子，你可以用兩個或更多等值分數寫出六年級學生的進度。社會情境

(D2) 為什麼描述六年級學生的第二天進展為 1/4 和 2/8 兩者都正確？社會情境

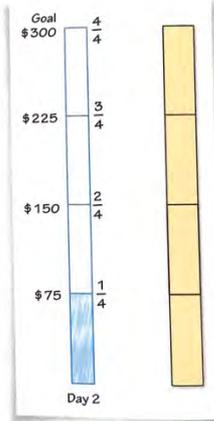
(E1) 第二天第 9 天結束時，六年級學生已籌集 240 美元。他們已經達到了目標的幾分之幾？社會情境

(E2) 展示如何在第 9 天遮蓋空白溫度計 社會情境



Examine the thermometers on the previous page and your fraction strips.

- A How can you tell whether the sixth graders raised the same amount each day? Explain.
- B What fraction of their goal did the sixth graders reach after Day 2? Day 4? Day 6? Day 8? Day 10?
- C
 1. Mary used her fourths strip to measure and label fractions and dollar amounts on the Day 2 thermometer at the right. Did she write the correct dollar amounts? How do you know?
 2. Use your fraction strips to measure and label fraction and dollar amounts on copies of the remaining thermometers.
- D
 1. Jeri says that she can express the sixth-graders' progress on Day 2 in two ways using equivalent fractions: $\frac{1}{4}$ or $\frac{2}{8}$ of the goal. Find some other days for which you can write the sixth-graders' progress with two or more equivalent fractions.
 2. Why do $\frac{1}{4}$ and $\frac{2}{8}$ both correctly describe the sixth-graders' progress on Day 2?
- E At the end of Day 9, the sixth graders have raised \$240.
 1. What fraction of their goal have they reached?
 2. Show how you would shade a blank thermometer for Day 9.



編碼：6-2-1-12

在問題 1.4 中，你使用分數來找到六年級籌款目標的部分。分數條和類似於籌款溫度計的圖示有時被稱為帶狀圖。這是因為分數條是一個長而瘦的矩形，就像一條長膠帶。

在這個問題中，你將使用分數來找到其他目標的部分，並使用比例來比較不同年級所籌集的金額。

比例比較陳述使用數字和文字來顯示兩個數量之間的關係。要寫比例，你可以使用「每」和「對於」這些詞，或者使用冒號。例如，你可以寫下這些比較陳述：

每當六年級籌集\$60 時，七年級籌集\$90。

六年級目標與七年級目標的比例是 60 對 90。

六年級目標與七年級目標的比例是 60:90。

你讀冒號「:」時使用「對於」這個詞。無論是「比」這個詞還是冒號在數學中都很常見。

下一頁的籌款溫度計顯示了每個年級和教師在十天後的目標和進展。

哪些情況涉及分數？哪些情況涉及比例？你如何決定？**社會情境**

.....

In Problem 1.4, you used fractions to find parts of the sixth-graders' fundraising goal. Fraction strips and pictures such as fundraising thermometers are sometimes called **tape diagrams**. This is because a fraction strip is a long, skinny rectangle, like a long piece of tape.

In this Problem, you will use fractions to find parts of the other goals, and you will use ratios to compare the amounts raised by different grades.

A ratio comparison statement uses both numbers and words to show how two quantities are related. To write ratios, you can use the words *for every*, *to*, or a colon (:). For example, you may write these comparison statements.

For every \$60 dollars the sixth graders raise, the seventh graders raise \$90.

or

The ratio of the sixth-grade goal to the seventh-grade goal is 60 to 90.

or

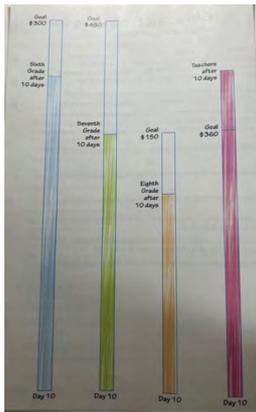
The ratio of the sixth-grade goal to the seventh-grade goal is 60 : 90.

You read the colon “:” using the word *to*. Both the word *to* and the colon are common in mathematics.

The fundraising thermometers on the next page show the goals and the progress of each grade and of the teachers after ten days.

- Which situations involve fractions? Ratios? How can you decide?

編碼：6-2-1-13(A1, A2, A3, B1, B2, B3)



(A1) 在籌款活動第 10 天結束時，每個年級達到了目標的百分之幾？**社會情境**

(A2) 到第 10 天結束時，老師們達到了目標的幾分之幾？**社會情境**

(A3) 每個小組籌集了多少钱？**社會情境**

格麗塔說：「我認為七年級學生在第 10 天結束時籌集了 300 美元，因為我

寫了幾個分數，這些分數與我用分數條 $\frac{2}{3}$ 找到的分數相同」 $\frac{2}{3} = \frac{4}{6} = \frac{20}{30} =$

$\frac{60}{90} = \frac{300}{450}$ 瑪格麗塔也畫了這幅畫。**社會情境**

(B1) 解釋瑪格麗塔如何找到這些等值分數。她怎麼樣圖片與她尋找等值分數的方法有關嗎？**社會情境**

(B2) 使用等值分數來顯示六年級學生在第 10 天結束時籌集了多少钱。**社會情境**

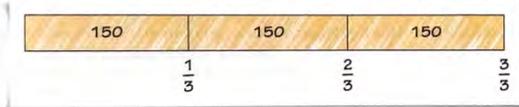
(B3) 使用等值分數來顯示教師在第 10 天結束時籌集了多少钱。**社會情境**

- A**
1. What fraction of its goal did each grade reach by the end of Day 10 of the fundraiser?
 2. What fraction of their goal did the teachers reach by the end of Day 10 of the fundraiser?
 3. How much money did each group raise?

B Margarita said: "I think the seventh graders raised \$300 by the end of Day 10 because I wrote several fractions that are equivalent to what I found with my fraction strips: $\frac{2}{3}$."

$$\frac{2}{3} = \frac{4}{6} = \frac{20}{30} = \frac{60}{90} = \frac{300}{450}$$

Margarita also drew this picture.



1. Explain how Margarita found these equivalent fractions. How does her picture relate to her method of finding equivalent fractions?
2. Use equivalent fractions to show how much money the sixth graders had raised by the end of Day 10.
3. Use equivalent fractions to show how much money the teachers had raised by the end of Day 10.

編碼：6-2-1-13(C1, C2, C3, C4, C5, D1, D2)

(C1) Brian 寫了這樣一個比較陳述：六年級學生籌集的金額與七年級學生籌集的金額之比是 250:300。這是正確的陳述嗎？解釋。社會情境

(C2) 凱特認為 250 美元是 25 張 10 美元的鈔票，300 美元是 30 張 10 美元的鈔票。她寫下了比例，25:30。用凱特的比例寫出一個比較語句。個人情境

(C3) Brian 和 Kate 的兩個比率相等嗎？解釋。個人情境

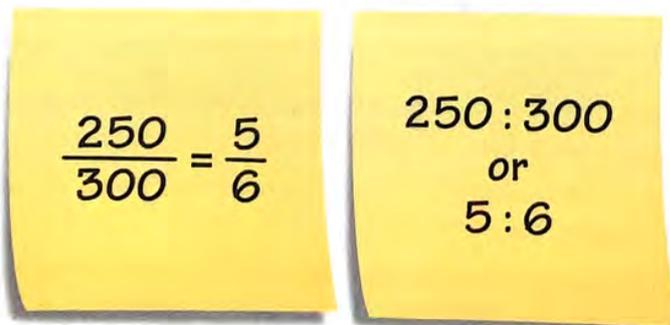
(C4) 如果凱特將 250 美元和 300 美元視為 50 美元鈔票的數量，她會寫出什麼比率？想想二十美元的鈔票有用嗎？解釋。個人情境

(C5) 使用等值比率，寫出兩份比較報表，比較六年級與八年級在籌款活動中籌集的資金數額。社會情境

(D1) 在籌款活動的最後一天，委託人使用分數和比率宣布結果。她的桌子上有兩張便籤紙。你認為每個便籤的含義是什麼？社會情境

(D2) 分數什麼時候有用？比率什麼時候有用？社會情境

- C**
1. Brian wrote this comparison statement: The ratio of the amount of money raised by the sixth graders to the amount raised by the seventh graders is 250 : 300. Is this a correct statement? Explain.
 2. Kate thought of \$250 as 25 ten-dollar bills and \$300 as 30 ten-dollar bills. She wrote the ratio, 25 : 30. Write a comparison statement using Kate's ratio.
 3. Are Brian and Kate's two ratios equivalent? Explain.
 4. What ratio would Kate write if she thought of \$250 and \$300 as numbers of fifty-dollar bills? Would thinking of twenty-dollar bills work? Explain.
 5. Write two comparison statements, using equivalent ratios, for amounts of money raised by the sixth grade compared to the eighth grade in the fundraiser.
- D**
- On the last day of the fundraiser, the principal announces the results using both fractions and ratios. She has these two sticky notes on her desk.



1. What do you think is the meaning of each note?
2. When are fractions useful? When are ratios useful?

編碼：6-2-2-1

比例陳述也可以寫成「每...」陳述。例如，「這次旅行每 10 個學生花費 \$120。」等值的比較陳述是「每個學生參加郊遊的費用是 \$12。」現在你可以說：

每 1 個學生花費 \$12。

這種特定的比較，即每一個學生的費用，稱為單位比。單位比是比較中其中一個數字為 1 單位的比較。

如果食物費用是 50 個學生 \$250，那麼每個學生的費用是多少？**個人情境**要回答這個問題，你需要找到單位比。

Ratio statements can also be written as “per” statements. For example, “It costs \$ 120 per 10 students to go on the trip.” An equivalent comparison statement is “the cost per student to go on a field trip is \$ 12.” Now you can say

\$12 for every 1 student

\$12 for each student

\$12 per student

This particular comparison, cost per one student, is called a unit rate.

A **unit rate** is a comparison in which one of the numbers being compared is 1 unit.

- If the cost of food is \$250 for 50 students, what is the cost per student?

To answer this question, you find the unit rate.

編碼：6-2-2-2(A, B)

我們經常分享食物，以便每個人得到相同的數量。這可能意味著食物被切成小塊。想想如何分享一條已經被標記為大小相等的塊的段耐嚼水果蟲軟糖。下面的段耐嚼水果蟲軟糖顯示出四個相等的部分。

(A) 怎麼能把這 4 段段耐嚼水果蟲軟糖平均分給四個人呢？個人情境

(B) 這 4 段段耐嚼水果蟲軟糖怎麼能平均分給三個人呢？或者每個人得到多少段段耐嚼水果蟲軟糖？個人情境

Often we share food so that each person gets the same amount. This may mean that food is cut into smaller pieces. Think about how to share a chewy fruit worm that is already marked in equal-sized pieces.

The chewy fruit worm below shows four equal segments.



How can you share this 4-segment chewy fruit worm equally among four people?

How many segments of the worm does each person get?

OR

How can you share this 4-segment chewy fruit worm equally among three people?

How many segments of the worm does each person get?

編碼：6-2-2-3(A1, A2, B1, B2, C1, C2, C3, C4, D, E)

在問題 A 和 B 中，找出每個人得到的段耐嚼水果蟲軟糖的比例。

(A1) 展示四人分享六段耐嚼水果蟲的兩種方式。在每種情況下，每個人得到多少個片段？個人情境

(A2) 展示六人分享八段耐嚼水果蟲的兩種方法。在每種情況下，每個人得到多少個片段？個人情境

(B1) 展示 12 個人如何分享一條 8 段耐嚼水果蟲軟糖。每個人都有多少段？個人情境

(B2) 展示五個人如何分享一條 3 段耐嚼水果蟲軟糖。每個人都有多少段？個人情境

Jena 拿想分享一條 6 段耐嚼水果蟲軟糖。膠帶圖如下顯示，她在蠕蟲上所做的標記，以便她可以平等地分享它給她的 CMP 小組的成員。

(C1) 她的小組有多少人？個人情境

(C2) 第(1)部分是否有多個可能的答案？解釋。個人情境

(C3) 每人的分段數是多少？個人情境

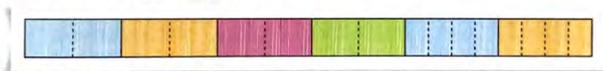
(C4) 寫出分數來表示每人得到段耐嚼水果蟲軟糖的部分。個人情境

(D) 您願意成為四人共享六段耐嚼水果蟲軟糖嗎？還是八個人共享一條 12 段耐嚼水果蟲軟糖？解釋。個人情境

(E) 回顧一下你在這個問題上的工作。描述您如何發現或使用的單位費率。個人情境

In Questions A and B, find the fraction of a chewy fruit worm each person gets.

- A**
- Show two ways that four people can share a 6-segment chewy fruit worm. In each case, how many segments does each person get?
 - Show two ways that six people can share an 8-segment chewy fruit worm. In each case, how many segments does each person get?
- B**
- Show how 12 people can share an 8-segment chewy fruit worm. How many segments are there for every person?
 - Show how five people can share a 3-segment chewy fruit worm. How much is this per person?
- C** Jena wants to share a 6-segment chewy fruit worm. The tape diagram below shows the marks she made on the worm so she can share it equally among the members in her CMP group.



- How many people are in her group?
 - Is there more than one possible answer to part (1)? Explain.
 - What is the number of segments per person?
 - Write a fraction to show the part of the chewy fruit worm each person gets.
- D** Would you rather be one of four people sharing a 6-segment chewy fruit worm or one of eight people sharing a 12-segment chewy fruit worm? Explain.
- E** Look back at your work on this Problem. Describe how you found or used unit rates.

編碼：6-2-2-4(A, B)

克里斯托和亞歷克薩兩姐妹要去參加一個奇怪的生日聚會。成對的派對客人沒有生日蛋糕，而是每組一個大的段耐嚼水果蟲軟糖，可以根據他們的年齡分享。由於姐妹兩年齡不同，她們分享的段耐嚼水果蟲軟糖也並不均等。Crystal 12 歲，Alexa 6 歲。它們段耐嚼水果蟲軟糖有 18 個節段。根據年齡，Crystal 獲得 12 個分段，Alexa 獲得 6 個分段。女孩所佔段耐嚼水果蟲軟糖的比例為 12 比 6，相當於她們年齡的比例為 12 比 6。

(A) 按照規定，女孩們會如何分享九段段耐嚼水果蟲軟糖呢？個人情境

(B) 2 比 1 的比率是單位比率。對於兩姐妹數字 2 和 1 是什麼意思？個人情境

Sometimes there are reasons to share quantities *unequally*. Suppose your older brother paid more than half the cost of a video game. You might think it is fair for him to spend more time playing the game. At a party, you might agree that your friend should take the bigger piece of chocolate cake because your friend likes chocolate more than you do.

Two sisters, Crystal and Alexa, are going to a strange birthday party. Instead of birthday cake, pairs of party guests are each served a large chewy fruit worm to share according to their ages. Since the sisters are not the same age, they do not share their fruit worm equally.

Crystal is 12 years old and Alexa is 6 years old. Their chewy fruit worm has 18 segments. According to their ages, Crystal gets 12 segments and Alexa gets 6 segments. The ratio of the girls' shares of the worm, 12 to 6, is equivalent to the ratio of their ages, 12 to 6.

- According to the rule, how would the girls share a 9-segment chewy fruit worm?

Since Crystal's age is two times Alexa's age, Crystal gets twice as many segments as Alexa. The ratio of Crystal's segments to Alexa's segments is 12 to 6 or 2 to 1.

- The ratio 2 to 1 is a unit rate. What do the numbers 2 and 1 mean for the sisters?

In this Problem you will explore situations that involve fractions and ratios.

編碼：6-2-2-5(A, B1, B2, B3, B4, C1, C2a, C2b, C2c)

(A) 畫出一些耐嚼的水果蟲軟糖，具有不同數量的節段，Crystal 和 Alexa 可以共享它們，而無需進行新的切割。個人情境

(B1) 賈里德今年 10 歲了。他的哥哥彼得今年 15 歲。有哪些他們可以分享耐嚼的水果蟲軟糖而無需進行新的切割嗎？個人情境

(B2) 對於第(1)部分中描述的每種分段，寫出一個比率來比較 Jared 獲得的段數與 Peter 獲得的段數。個人情境

(B3) 第(2)部分中所寫的比率彼此相等嗎？解釋。個人情境

(B4) 你會如何寫出一個單位費率來比較 Jared 和 Peter 得到了多少段？個人情境

(C1) 迦勒和以賽亞是兄弟。他們共享一個 14 段耐嚼的水果蟲軟糖。根據他們的年齡。他們多大了？個人情境

迦勒得到了耐嚼水果蟲軟糖的 14 節中的 8 部分，所以他得到了 $\frac{8}{14}$ ，以賽亞得到 $\frac{6}{14}$ 。

(C2a) 根據問題 A，Crystal 和 Alexa 在生日聚會上各得到了幾段耐嚼的水果蟲軟糖？個人情境

(C2b) 根據問題 B，賈里德和彼得在生日聚會上各得到了幾段耐嚼的水果蟲軟糖？個人情境

(C2c) 迦勒和以賽亞得到的片段比例與他們各自得到的耐嚼水果蟲軟糖的分數有何關係？個人情境

- A** Draw some chewy fruit worms with different numbers of segments that Crystal and Alexa can share without having to make new cuts.
- B**
1. Jared is 10 years old. His brother Peter is 15 years old. What are some chewy fruit worms they can share without having to make new cuts?
 2. For each worm you described in part (1), write a ratio comparing the number of segments Jared gets to the number of segments Peter gets.
 3. Are the ratios you wrote in part (2) equivalent to each other? Explain.
 4. How would you write a unit rate to compare how many segments Jared and Peter get?
- C**
1. Caleb and Isaiah are brothers. They share a 14-segment chewy fruit worm according to their age. How old could they be?



2. Caleb gets 8 out of the 14 segments of the chewy fruit worm, so he gets $\frac{8}{14}$ and Isaiah gets $\frac{6}{14}$ of the worm.
 - a. From Question A, what fractions of the chewy fruit worm do Crystal and Alexa each get at the birthday party?
 - b. From Question B, what fractions of the chewy fruit worm do Jared and Peter each get at the birthday party?
 - c. How does the ratio of segments that Caleb and Isaiah get relate to the fractions of the chewy fruit worm that they each get?

編碼：6-2-2-6(A1, A2, A3, A4, B1, B2, B3, B4, B5, C1, C2)

(A1) Crystal 希望快速計算許多不同數量的耐嚼水果蟲軟糖的成本。複製並填寫下面的費率表，其中包含每種耐嚼水果蟲的價格。個人情境

(A2) 3 條耐嚼水果蟲軟糖要多少錢？300 條耐嚼水果蟲軟糖要多少錢？個人情境

(A3) 50 美元可以買多少條要多少錢？10 美元可以買多少條要多少錢？個人情境

(A4) 耐嚼水果蟲軟糖單價是多少錢？單位費率是多少？個人情境

學生會還決定出售爆米花來籌集資金。一盎司爆米花（未爆開的）仁可生產 4 杯爆米花。一袋爆米花，可容納 2 杯爆米花。

(B1) 使用費率表查找確定爆米花杯數所需的爆米花仁數量。社會情境

(B2) 12 盎司的爆米花仁可以製作多少杯爆米花？那麼 30 盎司的爆米花仁？社會情境

(B3) 製作 40 杯爆米花需要多少盎司爆米花仁？100 杯爆米花呢？社會情境

(B4) 製作 100 份需要多少盎司玉米粒？社會情境

(B5) 製作 1 杯需要多少盎司玉米粒？社會情境

(C1) 費率表如何幫助您回答問題 A 和問題 B？社會情境

(C2) 單位費率如何幫助您回答問題 A 和問題 B？社會情境

- A 1. Crystal wants to calculate costs quickly for many different numbers of chewy fruit worms. Copy and complete the rate table below with prices for each of the numbers of chewy fruit worms.

Chewy Fruit Worm Pricing

Number of Worms	1	5	10	15	30	90	150	180
Reduced Price	■	■	■	■	\$3	■	■	■

- How much do 3 chewy fruit worms cost? 300 chewy fruit worms?
- How many chewy fruit worms can you buy for \$50? For \$10?
- What is the unit price of one chewy fruit worm? What is the unit rate?

- B The student council also decides to sell popcorn to raise money. One ounce of popcorn (unpopped) kernels yields 4 cups of popcorn. One serving is a bag of popcorn that holds 2 cups of popcorn.

- Use a rate table to find the number of ounces of popcorn kernels needed to determine the cups of popcorn.

Cups of Popcorn From Ounces of Kernels

Number of Cups of Popcorn	4	■	■	■	■	■	■	■	■	■	■	■	■
Number of Ounces of Popcorn Kernels	1	2	3	4	5	6	7	8	9	10	11	12	

- How many cups of popcorn can you make from 12 ounces of popcorn kernels? From 30 ounces of popcorn kernels?
- How many ounces of popcorn kernels are needed to make 40 cups of popcorn? To make 100 cups of popcorn?
- How many ounces of kernels are needed to make 100 servings?
- How many ounces of kernels are needed to make 1 cup?

- C
- How do rate tables help you answer Question A and Question B?
 - How do unit rates help you answer Question A and Question B?

編碼：6-2-4-1(A, B)

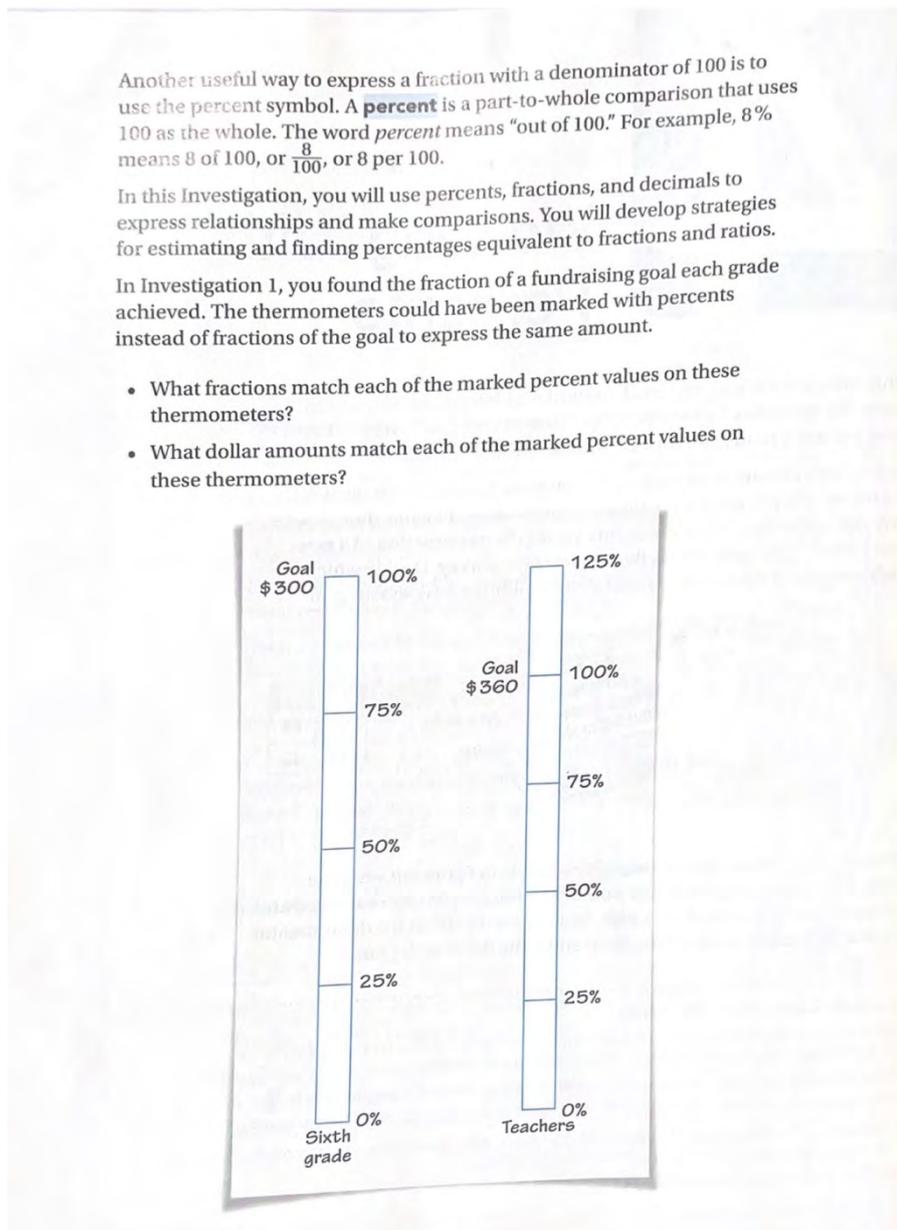
表達分母為 100 的分數的另一種有用方法是使用百分號。百分比是使用 100 作為整體的部分與整體比較。百分比一詞的意思是「滿分 100」。例如，8% 表示 100 中的 8 個、或 $\frac{8}{100}$ 個、或每 100 個中有 8 個。

在本研究中，您將使用百分比、分數和小數來表達關係並進行比較。您將製定估計和查找相當於分數和比率的百分比的策略。

在調查 1 中，您發現了每個年級實現的募款目標的比例。溫度計可以用百分比來標記，而不是目標的分數來表示相同的數量。

(A) 哪些分數與這些溫度計上標示的每個百分比值相符？**科學情境**

(B) 這些溫度計上標示的百分比值達到少美元？**科學情境**



編碼：6-2-4-2

運動統計數據通常以百分比表示。對於籃球隊來說，一個重要的統計數據是成功罰球百分比。你將使用數學來比較全國大學體育協會（NCAA）兩支知名男子籃球隊的籃球統計數據。

籃球隊的罰球命中率是如何計算的？職業情境

Sports statistics are often given in percents. An important statistic for basketball teams is the successful free-throw percent. You will use mathematics to compare the basketball statistics of two well-known men's basketball teams in the National Collegiate Athletic Association (NCAA).

- How are free-throw shooting averages determined for basketball teams?

編碼：6-2-4-3(A1, A2, A3)

最近一年，兩支 NCAA 籃球隊在 126 次罰球中罰球 108 次嘗試次數和 257 次嘗試中的 195 次。很難說哪支球隊更好那一年的罰球數使用原始數據。

因此，體育播音員經常給出百分比而不是原始數據。

阿威爾畫了一些類似於籌款溫度計的圖畫，以幫助他思考兩支球隊的罰球命中率。然後他就卡住了！幫助威爾用他畫的圖片來決定哪支球隊的罰球能力更好

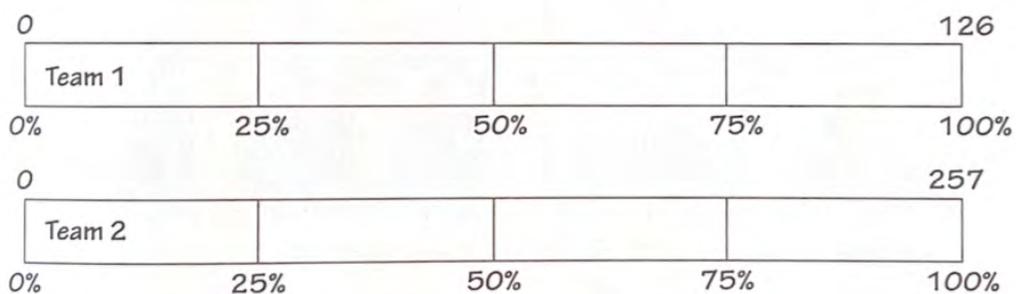
(A1) 對於每個條形，估計與圖中每個標記百分比對應的罰球次數。**職業情境**

(A2) 對於每支球隊，將百分比條塗上陰影以顯示該球隊的罰球次數並估算該百分比。解釋一下你是如何做到這一點的。**職業情境**

(A3) 按照這個速度，你期望第 1 隊罰球多少次在他們接下來的 200 次罰球嘗試中？你期望有多少第 2 隊將在接下來的 200 次罰球中投中？**職業情境**

During a recent year, two NCAA basketball teams made 108 out of 126 free-throw attempts and 195 out of 257 attempts. It is difficult to tell which team was better at free throws that year using raw numbers. Therefore, sports announcers often give percents instead of raw numbers.

- A** Will drew pictures similar to the fund-raising thermometers to help him think about the percent of free throws made by the two teams. Then he got stuck! Help Will use the pictures he drew to decide which team is better at free throws.



1. For each bar, estimate the number of free throws that should go with each marked percent in the picture.
2. For each team, shade the percent bar to show how many free throws the team made and estimate that percentage. Explain how you did this.
3. At this rate, how many free throws would you expect Team 1 to make in their next 200 free-throw attempts? How many would you expect Team 2 to make in their next 200 free-throw attempts?

編碼：6-2-4-3(B, C, D1, D2, E)

(B) 艾莉莎說，她可以使用下面的百分比條來更好地估計每支球隊的罰球命中率。複製並填寫她的百分比條來估計每支球隊的罰球百分比。將您的答案與問題 A 的答案進行比較。職業情境

(C) 問題 A 中和問題 B 中的 Alisha 都使用百分比條來顯示常見的百分比基準。每個學生使用什麼基準？職業情境

(D1) 使用百分比條和自己的想法來估計安吉拉、艾米麗和克里斯蒂娜的罰球百分比，誰是最好的罰球射手？職業情境

安琪拉 15 次罰球中 12 次

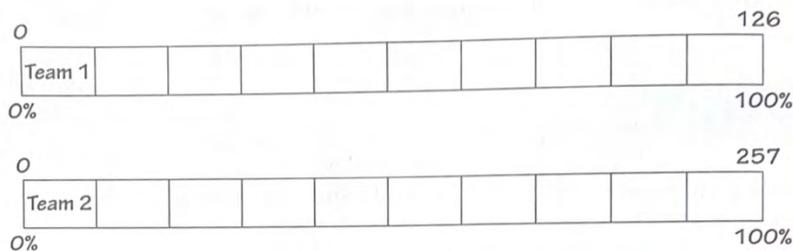
艾米麗 20 次罰球中 15 次

克里斯蒂娜罰球 16 罰 13 中

(D2) 使用第(1)部分的比率，您預期每位球員在接下來的 30 次罰球中罰球次數是多少？職業情境

(E) 在考慮了罰球命中率之後，威爾說百分比就像分數一樣。艾莉莎不同意，她說百分比更像是比率。你比較同意威爾的觀點還是艾莉莎的觀點？解釋。職業情境

- B** Alisha said that she could get better estimates of each team's free-throw percentage using the percent bars below. Copy and complete her percent bars to estimate each team's free-throw percentage. Compare your answers to your answers for Question A.



- C** Will, in Question A, and Alisha, in Question B, each use percent bars to show common percent benchmarks. What benchmarks does each student use?

- D** 1. Use percent bars and your own ideas to estimate free-throw percentages for Angela, Emily, and Christina. Who is the best free-throw shooter?

Angela made 12 out of 15 free throws

Emily made 15 out of 20 free throws

Christina made 13 out of 16 free throws

2. Using the rates in part (1), how many free throws would you expect each player to make on the next 30 free-throw attempts?

- E** After thinking about free-throw percentages, Will said that percents are like fractions. Alisha disagreed and said that percents are more like ratios. Do you agree more with Will or with Alisha? Explain.

編碼：6-2-4-4(A1, A2, A3, B1, B2, B3, B4, B5, B6, C)

(A1) 複製並填寫下面的遺傳性狀表。科學情境

(A2) 對於每個特徵，使用百分比條或其他策略來估計班上有這種特質的人的百分比。科學情境

(A3) 使用第(2)部分中的百分比作為比率，一所 500 人的學校中有多少人可能出現美人尖？科學情境

Marjorie 想找出班上有酒窩的學生的百分比。她說她可以很好地估計學生的百分比通過使用帶有 1% 標記的條形來對任何特徵進行標記，如下所示。

(B1) Marjorie 的班級有多少名學生？科學情境

(B2) Marjorie 如何算出 3.4 處於 10% 標記，13.6 處於 40% 標記？個人情境

(B3) Marjorie 班上有多少個學生有酒窩？科學情境

(B4) Marjorie 班上大約有百分之多少的學生有酒窩？科學情境

(B5) 你認為 Marjorie 是如何找到這個百分比的？個人情境

(B6) Marjorie 班上的酒窩比你們班上的酒窩更常見嗎？解釋。科學情境

(C) 使用百分比欄與使用比率表有何相似之處？個人情境

1. Copy and complete the table of genetic traits below.

Traits Observed in a Middle School Classroom

Trait	Yes	No	Total
Attached Earlobes	12	■	30
Dimples	7	■	30
Straight Hair	24	■	30
Widow's Peak	17	■	30

2. For each trait, use a percent bar or another strategy to estimate the percent of people in the class who have that trait.

3. Using the percents from part (2) as rates, how many people in a school of 500 are likely to have a widow's peak?

B Marjorie wanted to find the percent of students in her class with dimples. She said that she could get a very good estimate of the percent of students with any trait by using a bar with a mark for 1% like the one below.

1. How many students are in Marjorie's class?

2. How did Marjorie figure out that 3.4 is at the 10% mark and 13.6 is at the 40% mark?

3. How many students in Marjorie's class have dimples?

4. About what percent of students in Marjorie's class have dimples?

5. How do you think Marjorie found that percent?

6. Are dimples more common in Marjorie's class than in your class? Explain.

C How is using a percent bar like using a rate table?

編碼：6-2-4-5

你有喜歡的藝術作品嗎？是由著名藝術家如克勞德·莫奈、喬治亞·奧姬芙創作的，還是由你的小妹妹創作的？

藝術博物館擁有的作品數量遠超過他們能同時展示的數量。這意味著當藝術品不在畫廊展示時，必須將其存放起來。博物館策展人負責選擇哪些作品展出。

位於明尼蘇達州明尼阿波利斯的沃克藝術中心舉辦了一個名為「50/50」的展覽。對於這個展覽，公眾通過互聯網投票選擇他們希望博物館展示的作品，策展人則選擇其餘的作品。

你認為標題中的「50/50」指的是什麼？**社會情境**

4.3 The Art of Comparison Using Ratios and Percents

Do you have a favorite work of art? Is it by a famous artist such as Claude Monet, Georgia O'Keefe, or is it by your little sister?

Art museums own more pieces than they can display at one time. This means that art must be stored when it is not hanging in a gallery. A museum curator chooses which works to exhibit.

The Walker Art Center in Minneapolis, Minnesota held an exhibit entitled $\frac{50}{50}$. For the exhibit, the public voted via the Internet on which pieces they wanted the museum to display, and curators chose the remaining pieces.

- What do you think $\frac{50}{50}$ refers to in the title?

編碼：6-2-4-6(A, B, C1, C2, D1, D2, E)

另一家美術館也舉辦了類似的展覽。圖為展覽的公眾部分。策展人的部分被掩蓋了。

(A)您估計展覽中有多少件藝術品？還有其他信息可以幫助您做出更好的估計嗎？解釋。個人情境

(B) 下面是完整展覽的圖片。這張圖如何改變你對問題 A 的估計？個人情境

問題 B 中的圖片向您展示了展覽的每個部分。

(C1) 畫出整個展品的尺寸圖。個人情境

(C2) 根據你的圖紙估算每個部分的作品數量。情境

(D1) 估計公眾選擇展品的百分比。估計策展人選擇的百分比。社會情境

(D2) 使用第(1)部分中的百分比。如果展覽有 200 件作品，您認為公眾會選擇多少件作品？你有多少認為策展人選擇了？社會情境

(E) 您會使用百分比和比率為該展覽選擇什麼標題？社會情境

B Below is a picture of the complete exhibit. How does this picture change your estimate from Question A?



C The picture in Question B shows you about $\frac{2}{3}$ of each part of the exhibit.

1. Make a drawing to show the size of the whole exhibit.
2. Use your drawing to estimate the number of works in each part.

D 1. Estimate the percent of the exhibit chosen by the public. Estimate the percent chosen by curators.

2. Use the percents from part (1). If there were 200 pieces in the exhibit, how many artworks do you think the public chose? How many do you think the curators chose?

E What title would you choose for this exhibit using percents and ratios?

編碼：6-5-4-1(A, B)

百分比是一種特殊的分數寫法，分母為 100。你可以把百分比理解為「每 100 個中的幾個」。例如，6% 的銷售稅意味著每件商品的每一美元，消費者需額外支付百分之六的美元，這相當於 6 美分，即 0.06 美元。

$$\$1.00 + (\$1.00 \text{ 的 } 6\%) = \$1.00 + \$0.06 = \$1.06$$

另一種思考方式是記住 \$1.00 是 100 個美分。

$$100 \text{ 個美分} + (100 \text{ 個美分的 } 6\%) = 100 \text{ 個美分} + 6 \text{ 個美分} = 106 \text{ 個美分} = \$1.06$$

(A) 在 6% 的稅率下，一件價格為 \$5 的商品的總成本是多少？個人情境

(B) 在 6% 的稅率下，一件價格為 50 美分的商品的總成本是多少？個人情境

A percent is a special way of writing a fraction with a denominator of 100. You can think of percent as meaning "out of 100."

For example, a sales tax of 6% means that for every dollar an item costs, a person pays an additional six hundredths of a dollar. This is equal to 6 cents, or \$.06.

$$\begin{aligned} \$1.00 + (6\% \text{ of } \$1.00) &= \$1.00 + \$0.06 \\ &= \$1.06 \end{aligned}$$

Another way to think about this is to remember that \$1.00 is 100 pennies.

$$\begin{aligned} 100 \text{ pennies} + (6\% \text{ of } 100 \text{ pennies}) &= 100 \text{ pennies} + 6 \text{ pennies} \\ &= 106 \text{ pennies} \\ &= \$1.06 \end{aligned}$$

- At a 6% tax rate, what would be the total cost for an item priced at \$5?
- At a 6% tax rate, what would be the total cost for an item priced at 50¢?

編碼：6-5-4-2

你如何使用百分比條來計算給定數量的百分比？個人情境



How can you use a percent bar to figure out percentages of a given amount?

編碼：6-5-4-3(A, B1, B2, B3, C1, C2a, C2b, C3a, C3b)

為每個問題寫一個數字句子。然後回答問題。

(A) Jill 想買一本音樂專輯，價格為\$7.50。銷售稅是6%。專輯的總成本是多少？嘗試找到多種解決這個問題的方法。解釋你找到的不同方法。個人情境

各州有不同的銷售稅率。計算下列每個商品的總成本：

(B1) 如果銷售稅率是7%，那麼一本價格為\$2.00的雜誌的總成本是多少？

個人情境

(B2) 如果銷售稅率是6.5%，那麼一本價格為\$5.00的書的總成本是多少？

個人情境

(B3) 如果銷售稅率是7.5%，那麼一本價格為\$0.50的漫畫書的總成本是多少？個人情境

注意：當銷售稅的百分比計算結果不是整數時，標準做法是將稅額四捨五入到下一分錢。

(C1) Alexis 買了一個視頻遊戲機。她不記得稅前的價格。她知道6%的銷售稅是\$4.80。為了找出遊戲機的價格，她畫了一個百分比條或帶狀圖。遊戲機的稅前價格是多少？你怎麼知道的？個人情境

Frank 買了一個新的視頻遊戲。5%的銷售稅是\$0.75。遊戲的稅前價格是多少？

(C2a) 畫一個帶狀圖來說明這個問題。個人情境

(C2b) 找出遊戲的稅前價格。解釋你是怎麼知道的。Nic 包括7%的稅在內，總共支付了\$25.68購買了一個遊戲。稅前價格是多少？個人情境

(C3a) 畫一個帶狀圖來說明這個問題。個人情境

(C3b) 找出遊戲的稅前價格。解釋你是怎麼知道的。個人情境

Write a number sentence for each question. Then answer the question.

A Jill wants to buy an album of music that is priced at \$7.50. The sales tax is 6%. What will be the total cost of the album?
Try to find more than one way to solve this problem. Explain the different methods you find.

B States have different sales tax rates. Find the total cost of each item below.

1. a \$2.00 magazine if the sales tax rate is 7%
2. a \$5.00 book if the sales tax rate is 6.5%
3. a \$.50 comic book if the sales tax rate is 7.5%

Note: When a percent calculation for sales tax does not come out to a whole number of cents, the standard practice is to round up the tax to the next penny.

C

1. Alexis bought a video game player. She does not remember the price before tax. She does know that the 6% sales tax came to \$4.80. To find the price of the game player, she drew a percent bar, or tape diagram.
What was the price of the game player before tax? How do you know?

2. Frank bought a new video game. The 5% sales tax was \$.75. What was the price of the game before tax?

- a. Draw a tape diagram to illustrate the problem.
- b. Find the price (before tax) of the game. Explain how you know.



3. Nic paid a total of \$25.68 for a game, including 7% tax. What was the price before tax?
- a. Draw a tape diagram to illustrate the problem.
 - b. Find the game price before tax. Explain how you know.

編碼：6-5-4-3(D1, D2, D3)

在做了很多價格加稅的計算後，Susan 注意到所有的問題都可以用兩種不同的方法來解決。

(D1) Susan 說，要找出一輛價格為\$250 的自行車及 7%的稅的總成本，可以先計算\$250 的 7%，然後將這個數字加到\$250 上。她知道的信息顯示在百分比條上。個人情境

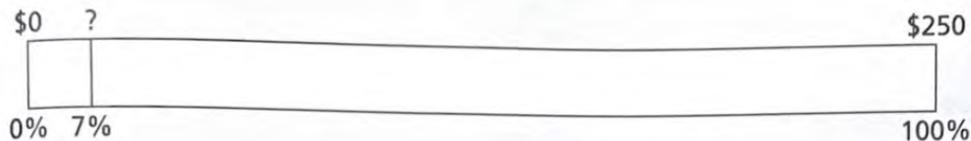
寫一句以「總成本 =」開頭的句子，來展示如何使用這種方法來找出總成本。

(D2) 另一種方法是直接乘以 1.07 (250)。寫一句以「總成本 =」開頭的句子，來展示如何使用這種方法來找出總成本。個人情境

(D3) 這兩種方法都正確嗎？為什麼或為什麼不？個人情境

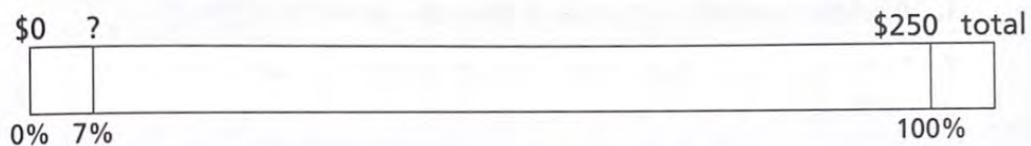
D After Susan did many price-plus-tax calculations, she noticed that all of the problems could be done two different ways.

1. Susan said to find the total cost of a \$250 bicycle and the 7% tax, you could figure 7% of \$250 and then add that amount to \$250. The information she knows is shown on the percent bar.



Write a sentence that starts "Total cost =" to show how to use this method to find the total cost.

2. The other way to do this is simply to multiply 1.07(250). Write a sentence that starts "Total cost =" to show how to use this method to find the total cost.



3. Are both methods correct? Why or why not?

編碼：6-5-4-4(A1, A2)

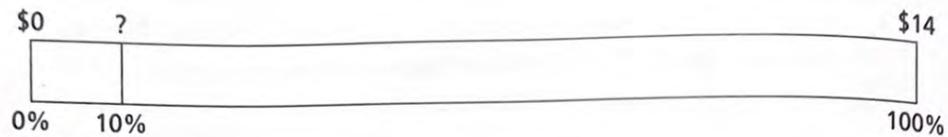
在大多數餐廳，顧客會給服務員小費以表達對良好服務的感謝。典型的小費是餐費的 15% 到 20%。

(A1) 餐廳賬單為\$14 時，小費可能是多少？個人情境

(A2) 百分比條或帶狀圖如何幫助你計算\$14 賬單上的小費？個人情境

At most restaurants, customers pay their server a tip for providing good service. A typical tip is 15% to 20% of the price of the meal.

- What could be the tip on a restaurant bill of \$14?
- How might this percent bar, or tape diagram, help you figure out the tip on a \$14 bill?



編碼：6-5-4-5(A1, A2, A3, B1,B2 ,B3, C1, C2, C3, D1, D2, D3, E1, E2)

嘗試找到多種方法來回答以下關於餐廳給小費的問題。用數字句子記錄你的想法。準備好解釋不同的方法。

讓你的小組每個成員使用 Larry's Lunch Place 的菜單來點一份午餐。寫下你的小組訂購的所有項目列表。

(A1) 找出你的小組食品總賬單及 6% 的銷售稅。個人情境

(A2) 你會留下多少小費（總賬單的 15% 到 20% 之間）？個人情境

(A3) 假設你的小組成員決定平分餐費。每個人分攤的費用是多少，包括小費？

許多人使用基準來確定小費。Gil 解釋他的策略：「我總是先計算賬單的 10%，然後用這個信息來計算 15% 或 20% 的小費。」個人情境

(B1) 找出 \$20.00 的 10% 和 5%。這兩個百分比是如何關聯的？個人情境

(B2) 找出 \$24.50 的 10% 和 20%。這兩個百分比是如何關聯的？個人情境

(B3) 找出 \$17.35 的 10%。用這個來找出 \$17.35 的 15% 和 20%。解釋你在每種情況下的推理。個人情境

在 Kadisha 所在的州，銷售稅是 5%。Kadisha 說她通過將賬單上顯示的稅額乘以 3 來計算 15% 的小費。對於稅額為 \$0.38 的賬單，Kadisha 的小費是 $\$0.38 \times 3 = \1.14 。

(C1) 為什麼 Kadisha 的方法有效？個人情境

(C2) 使用類似的方法計算 20% 的小費。解釋你的推理。個人情境

(C3) 當人們留下 15% 或 20% 的小費時，他們通常會將其四捨五入到最接近的 5 或 10 美分。如果 Kadisha 總是四捨五入，她的賬單上的 20% 小費是多少？個人情境

一位顧客給了 Jerome \$2.50 作為服務的小費。這筆小費是食物總賬單的 20%。

(D1) 食物賬單是多少？個人情境

(D2) 畫一個百分比條或帶狀圖來說明這個問題及其解決方案。個人情境

(D3) 解釋你用來回答第(1)部分的推理。個人情境

Katrina 做了許多價格加小費的計算後，注意到所有問題都可以用兩種方式解決。例如，一種方法是通過乘法和加法找出 \$25 餐費加 20% 小費的總成本。另一種方法是用一次乘法解決。

(E1) 分別寫一句以「總價格=」開頭的句子來說明這兩種方法。個人情境

(E2) 這兩個句子之間有什麼關聯？個人情境

Try to find more than one way to answer each of the following questions about restaurant tipping. Record your thinking in number sentences. Be prepared to explain your different methods.

A Have each member of your group use the menu from Larry's Lunch Place to make up a lunch order. Write a list of all the items ordered by your group.

1. Find the total bill for food and 6% sales tax for your group.
2. How much will you leave as a tip (between 15% and 20% of the total bill)?
3. Suppose that your group members decide to share the cost of the meal equally. What is each person's share of the cost, including tip?

B Many people use benchmarks for determining tips. Gil explains his strategy: "I always figure out 10% of the bill, and then I use this information to calculate a 15% or 20% tip."

1. Find 10% and 5% of \$20.00. How are the two percents related?
2. Find 10% and 20% of \$24.50. How are the two percents related?
3. Find 10% of \$17.35. Use this to find 15% and 20% of \$17.35. Explain your reasoning in each case.

C The sales tax in Kadisha's state is 5%. Kadisha says she computes a 15% tip by multiplying the tax shown on her bill by 3. For a bill with a tax charge of \$.38, Kadisha's tip is $$.38 \times 3 = \1.14 .

1. Why does Kadisha's method work?
2. Use a similar method to compute a 20% tip. Explain your reasoning.
3. When people leave a 15% or 20% tip, they often round up to the nearest multiple of 5 or 10 cents. If Kadisha always rounds up, what is a 20% tip on her bill?

D A customer left Jerome \$2.50 as a tip for service. That tip is 20% of the total bill for the food.

1. How much is the food bill?
2. Draw a percent bar or tape diagram to illustrate this problem and its solution.
3. Explain the reasoning you used to answer part (1).

E After Katrina did many price-plus-tip calculations, she noticed that all of the problems could be done two ways. For example, one way to find the total cost of a \$25 meal + 20% tip uses a multiplication and an addition. The other way uses a single multiplication.

1. Write a sentence starting "Total price =" for each of these ways.
2. How are these two sentences related?



編碼：6-5-4-6(A, B, C)

報紙上常有折價券。這裡顯示了洗髮精的折價券。

洗髮精的正常價格為 5.00 美元。艾莉西亞想算出 1.50 美元的折扣是 5.00 美元的折扣百分比是多少。

(A) 如何將折扣以分母為 100 寫為正常價格的一小部分？個人情境

(B) 如何將折扣寫成正常價格的百分比？個人情境

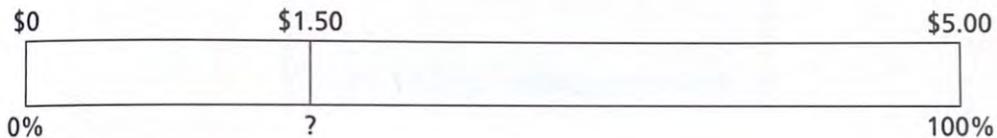
(C) 下面的百分比條如何幫助您找到 1.50 美元是多少百分比？個人情境

Newspapers often have coupons for discounts. A discount coupon for shampoo is shown here.



The regular price for the shampoo is \$5.00. Alicia wants to figure out what percent discount \$1.50 is of \$5.00.

- How can you write the discount as a fraction of the regular price with denominator 100?
- How can you write the discount as a percent of the regular price?
- How could the percent bar below help you find what \$1.50 is as a percent of the regular price?



編碼：6-5-4-7(A, B, C)

使用您對百分比的了解來回答以下有關折扣的問題。用算式寫下你的推理。準備好解釋你的想法。

- (A) 使用此處顯示的優惠券可以獲得多少百分比的折扣？試著去找更多解決這個問題的方法。個人情境
- (B) 使用此處顯示的優惠券可以獲得多少百分比的折扣？嘗試尋找多種方法來解決這個問題。準備好解釋你的方法。個人情境
- (C) 滑板 25% 折扣為 24.75 美元。之前的費用是多少折扣？個人情境

Use what you know about percents to answer the following questions about discounts. Record your reasoning in number sentences. Be prepared to explain your thinking.

- A** What percent discount do you get with the coupon shown here? Try to find more than one way to solve this problem.

Any two spiral-bound notebooks	
Regular price	\$3.00
With coupon	\$2.25

Not valid with any other offer

- B** What percent discount do you get with the coupon shown here? Try to find more than one way to solve this problem. Be prepared to explain your methods.

Regular price:\$29.50
Now pay just:\$17.70

- C** A 25% discount on a skateboard is \$24.75. What is the cost before the discount?

編碼：6-5-4-7(D1, D2, D3, D4a, D4b, E1, E2)

麗塔、雅子和和子各自購買的一些商品都獲得了折扣。

(D1) 在音樂商店，麗塔購買原價 48 美元的商品可享 12 美元的折扣。她得到了多少百分比的折扣？**個人情境**

(D2) Masako 在百貨公司購物滿 100 美元可享 25 美元折扣優惠券。她買了一件售價 125 美元的夾克。她購買的商品折扣百分比是多少？**個人情境**

(D3) 描述您用來回答第 (1) 和 (2) 部分的計算。解釋為什麼你的方法有效。

Masako 的姊姊 Kazuko 也有一張 25 美元的折價券。她在同一家商店花了 110 美元買了一件雨衣。**個人情境**

(D4a) 哪位姊妹的折扣更大呢？**個人情境**

(D4b) 您如何在不實際計算任何折扣百分比的情況下回答 (a) 部分？**個人情境**

Aladar 使用 20% 折扣券購買了一部售價 95 美元的新智慧型手機。當他到達電信商店時，他得知他們正在進行 30% 的折扣。**個人情境**

店員先計算出 30% 的折扣，然後將 20% 的優惠券應用在折扣金額上。**個人情境**

(E1) 最終價格應該是多少（不含銷售稅）？**個人情境**

(E2) 最終價格與 50% 折扣相同嗎？解釋。**個人情境**

- Ⓓ
- (a) Masako, and Kazuko each got discounts on some items they bought.
1. At a music store, Rita got a \$12 discount on an item originally priced at \$48. What percent discount did she get?
 2. Masako had a \$25-off coupon on a purchase of \$100 or more at a department store. She bought a jacket with a price of \$125. What is the percent discount on her purchase?
 3. Describe the calculations you used to answer parts (1) and (2). Explain why your methods work.
 4. Masako's sister Kazuko also had a \$25-off coupon. She bought a rain jacket for \$110 at the same store.
 - a. Which sister got the greater percent discount?
 - b. How can you answer part (a) without actually calculating any discount percents?
- (b) Aladar used a 20% -discount coupon to buy a new smartphone priced at \$95. When he got to the telecom store, he learned that they were having a 30% -off sale.



The clerk calculated the 30% discount first and then applied the 20% -off coupon to the discounted amount.

1. What should be the final price (without sales tax)?
2. Is that final price the same as a 50% discount? Explain.

編碼：6-5-4-8(A1)

經營俱樂部時出現了以下問題。對於每個問題，請按照以下說明進行操作。

選擇能給出答案的數字和運算。

寫出顯示所需計算的數學表達式。

使用計算機、心算或紙筆演算法找到準確答案。

用一個或多個完整的句子回答問題。

一群男孩和女孩計劃經營割草服務，為俱樂部籌款。他們決定透過測量要修剪的面積來確定任何草坪的價格。

(A1) 下圖所示草坪的面積是多少平方公尺？**社會情境**

(A2) 有過割草經驗的男孩和女孩認為這項工作的價值約為 25 美元。每平方公尺的價格是多少美元？**社會情境**

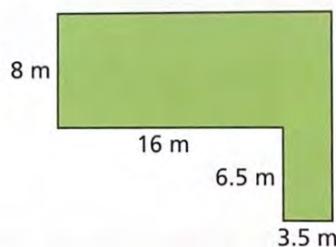
(A3) 使用第 (2) 部分中的每平方公尺價格，男孩和女孩修剪面積為 200 平方公尺的草坪應收取多少費用？**社會情境**

The following questions came up in operating the Club. For each question, follow the directions below.

- Choose numbers and operations that will give the answer.
- Write mathematical expressions that show the required calculations.
- Use a calculator, mental arithmetic, or paper and pencil algorithms to find exact answers.
- Answer the question in one or more complete sentences.

A One group of boys and girls planned to operate a lawn-mowing service as a fundraiser for the Club. They decided to set the price for any lawn by measuring the area to be mowed.

1. What is the area in square meters of the lawn shown below?



2. The boys and girls who had experience mowing lawns thought the job was worth about \$25. What is the price in dollars per square meter?
3. Using the price per square meter from part (2), what should the boys and girls charge to mow a lawn with area 200 square meters?

編碼：6-5-4-8(B1, B2, B3a, B3b, B3c, C1, C2, C3, C4)

CBGC 向大學生和高中生支付每小時 5.75 美元，用於輔導年輕男孩和女孩。

(B1) 如果其中一位導師週一工作 3.4 小時，週四工作 2.7 小時，導師這一週的收入是多少？**職業情境**

(B2) 如果俱樂部的輔導預算為每週 250 美元，可以提供多少補習時數？丹尼正在給安倍輔導。以下是兩次檢查測驗的結果。**職業情境**

(B3a) 將安倍第一次測驗的分數（滿分 30 分中的 21 分）寫成百分比。**職業情境**

(B3b) 安倍對第二次檢查的進步感到滿意。他說他已經進步了 10%。丹尼認為新分數並沒有比舊分數增加 10%。誰是正確的？解釋。**職業情境**

(B3c) 安倍目前在體檢總分 60 分中得了 45 分。本單元還有一項測驗。滿分也是 30 分。他必須在最後一次測驗中得到多少分數才能將他的體檢分數提高到 80%？**職業情境**

夏末，俱樂部從割草團體和其他籌款活動中獲得了足夠的資金來支付乘坐巴士和進入遊樂園的費用。

(C1) 假設有 325 位俱樂部會員想去，每輛巴士可容納 60 位俱樂部會員。此行程需要多少輛巴士？**社會情境**

(C2) 假設公車公司對每輛公車每英里收費 2.95 美元。124 英哩往返的每輛巴士費用是多少？所有巴士的總費用是多少？**社會情境**

(C3) 假設巴士公司收取 6% 的銷售稅。稅金和帳單總額是多少？

(C4) 假設行程需要 3 小時 15 分鐘的車程往返 124 英哩。公共汽車的平均速度是多少英里每小時？

6 The CBGC pays college and high school students \$5.75 per hour to tutor the younger boys and girls.

1. If one of those tutors works 3.4 hours on Monday and 2.7 hours on Thursday, what will the tutor earn for the week?
2. If the Club has a tutoring budget of \$250 per week, how many tutoring hours can be provided?
3. Danny is tutoring Abe. Below are the results of two check-up quizzes.
 - a. Write the score of Abe's first quiz (21 out of 30) as a percent.
 - b. Abe is pleased with his improvement on the second check-up. He says he has made a 10% improvement. Danny says the new score is not a 10% increase over the old score. Who is correct? Explain.
 - c. Abe now has 45 out of a total of 60 points on check-up quizzes. There is one more quiz to come in this Unit. It is also out of 30 points. What does he have to score on this last quiz to raise his check-up quiz grade to 80% overall?



At the end of the summer, the Club had enough money from the lawn-mowing group and other fundraising efforts to pay for a bus ride and admission to an amusement park.

1. Suppose 325 club members want to go, and each bus holds 60 club members. How many buses are needed for the trip?
2. Suppose the bus company charges \$2.95 per mile for each bus. What is the cost per bus for the 124-mile round trip? What is the cost for all buses combined?
3. Suppose the bus company charges 6% sales tax. What are the tax and the total bill?
4. Suppose the trip takes 3 hours and 15 minutes of driving time for the 124-mile round trip. What is the average speed of the buses in miles per hour?

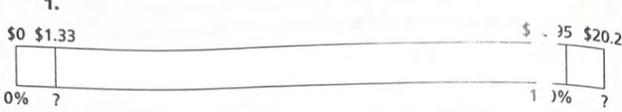
編碼：6-5-4-8(D1, D2, D3, D4, D5)

寫下並解決一個可以用下面的每個百分比條或數字句子來表示的問題。**無**
情境

(如下圖)

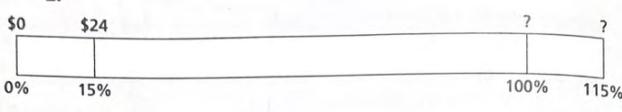
D Write and solve a problem that could be represented by each percent bar or number sentence below.

1.



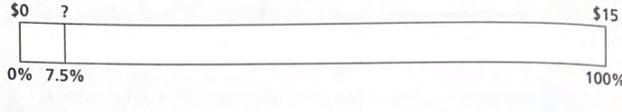
A horizontal percent bar representing a problem. The left end is labeled "\$0" and the right end is labeled "\$20.28". A vertical tick mark is located at the 10% position, with "\$1.33" written above it. Below the bar, the left end is labeled "0%" and the right end is labeled "10%". There are question marks below the bar at the 0% and 10% positions.

2.



A horizontal percent bar representing a problem. The left end is labeled "\$0" and the right end is labeled "?". A vertical tick mark is located at the 15% position, with "\$24" written above it. Another vertical tick mark is located at the 100% position, with "?" written above it. Below the bar, the left end is labeled "0%", the 15% position is labeled "15%", the 100% position is labeled "100%", and the right end is labeled "115%".

3.



A horizontal percent bar representing a problem. The left end is labeled "\$0" and the right end is labeled "\$15". A vertical tick mark is located at the 7.5% position, with "?" written above it. Below the bar, the left end is labeled "0%" and the right end is labeled "100%".

4. $20.25 = 1.35P$

5. $\frac{20}{120} = r$

美國六年級課後練習

編碼：6(h)-2-1-1(A, B)

另一所中學進行了與問題中學相同類型的籌款活動。下面的橫幅顯示了每個年級的目標。籌款目標五年級\$120 八年級\$300 七年級\$240 六年級\$180。

(A) 寫出校長在以下情況下可以做出的三個陳述：比較每個年級設定的目標。社會情境

(B) 老師們設定的目標是 225 美元。寫兩條語句校長可以用來將此目標與第八個目標進行比較評分者的目標。社會情境

1. Another middle school conducted the same type of fundraiser as the middle school in the Problems. The banner below shows the goals for each grade.



- Write three statements that the principal could make when comparing the goals each grade has set.
- The teachers set a goal of \$225. Write two statements the principal could use to compare this goal to the eighth graders' goal.

編碼：6(h)-2-1-2

布萊斯和瑞秋正在為當地食品銀行收集罐頭食品。Bryce 的目標是收集 32 件物品。Rachel 的目標是收集 24 件物品。如果瑞秋和布萊斯都實現了他們的目標，那麼瑞秋能獲得布萊斯目標的幾分之幾？社會情境

2. Bryce and Rachel are collecting canned goods for the local food bank. Bryce's goal is to collect 32 items. Rachel's goal is to collect 24 items. If Rachel and Bryce each meet their goal, what fraction of Bryce's goal does Rachel collect?

編碼：6(h)-2-1-3(A, B)

六年級一個班有 12 名男生，24 名女生。

(A) 考慮一下這個說法：每 2 個男孩就有 4 個女孩。你同意這個說法嗎？

解釋。個人情境

(B) 再寫兩條語句來比較男孩的數量班級有多少女生。個人情境

3. A sixth-grade class has 12 boys and 24 girls.

a. Consider this statement: *For every 2 boys, there are 4 girls.* Do you agree with the statement? Explain.

b. Write two more statements comparing the number of boys in the class to the number of girls.

編碼：6(h)-2-1-4

六年級不同班級，男女生比例為 3 : 2。如何這個班有多少個男生，有多少個女生？是否有不止一個可能的答案？解釋。個人情境

4. In a different sixth-grade class, the ratio of boys to girls is 3 : 2. How many boys and how many girls could there be in this class? Is there more than one possible answer? Explain.

編碼：6(h)-2-1-5

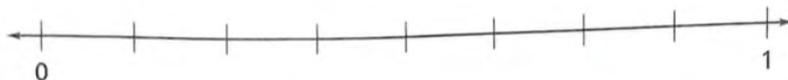
如果你從一個開始，你可以製作什麼分數條？四分之一一條帶？無情境

5. What fraction strips could you make if you started with a fourths strip?

編碼：6(h)-2-1-6

下面是一條用八分之一帶標記的數軸。還有哪些條帶可以在這條數軸上標記一些標記？無情境

6. Below is a number line labeled using an eighths strip. What other strips could label some of the marks on this number line?



編碼：6(h)-2-1-7

對於練習 15-17，複製每條數軸。製作並使用分數條或使用其他方法來估計和命名點一小部分。無情境

For Exercises 7–9, copy each number line. Make and use fraction strips or use some other method to estimate and name the point with a fraction.



編碼：6(h)-2-1-8

(如編碼：6(h)-2-1-7 之題幹) 無情境



編碼：6(h)-2-1-9

(如編碼：6(h)-2-1-7 之題幹) 無情境

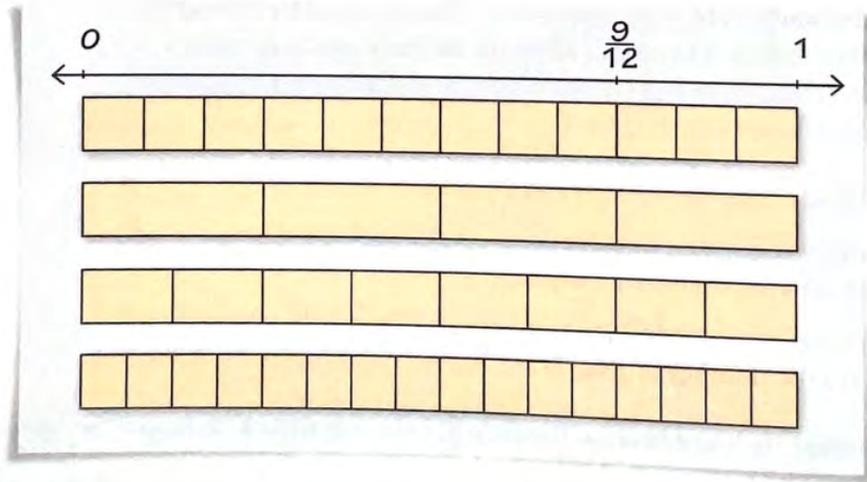


編碼：6(h)-2-1-10(A, B)

這些學生開始使用不同的分數條製作一條數軸，如下圖所示。一名學生使用頂部分數條在數軸上進行標記

- (A) 說出此處顯示的其他三個等於 $\frac{9}{12}$ 的分數。無情境
- (B) 說出另一個相當於 $\frac{9}{12}$ 的分數。無情境

10. These students began to make a number line using different fraction strips as shown in the picture below. One student used the top fraction strip to mark $\frac{9}{12}$ on the number line.



- a. Name three other fractions shown here that are equivalent to $\frac{9}{12}$.
- b. Name another fraction equivalent to $\frac{9}{12}$.

編碼：6(h)-2-1-11(A, B, C, D)

艾琳用五分之一的條帶在她的數軸上標記 $\frac{1}{5}$ 、 $\frac{2}{5}$ 、 $\frac{3}{5}$ 、 $\frac{4}{5}$ ，如下所示。

(A) 為什麼不需要 $\frac{5}{5}$ 標籤？**個人情境**

(B) 莎莉像這樣標記她的分數條（如圖）。她說她的任何兩個片段都與 $\frac{2}{5}$ 相同。你同意她的觀點嗎？解釋莎莉的思維與數軸的標記方式有何不同。

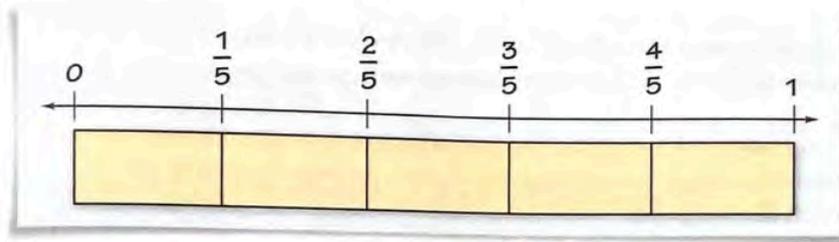
個人情境

(C) 如果您標記 $\frac{1}{10}$ 、 $\frac{2}{10}$ 、 $\frac{3}{10}$ 、 $\frac{4}{10}$ 、 $\frac{5}{10}$ 、 $\frac{6}{10}$ 、 $\frac{7}{10}$ 、 $\frac{8}{10}$ 、 $\frac{9}{10}$ 、 $\frac{10}{10}$ 標記在 Erin 數軸上。標記現在有多個標籤？為什麼是這樣？**個人情境**

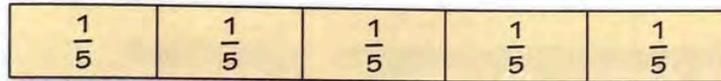
(D) 如果將數軸從 0 延伸到 2，則每個整數長度將有五分之五。對於從 0 到 2 的數軸，您還可以做出哪些其他「對於每個」陳述？**無情境**

11. Erin used a fifths strip to mark and label $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ on her number line, as shown below.

a. Why is no label needed for $\frac{5}{5}$?



b. Sally marked her fraction strip like this.



She says any two segments on her strip are the same as $\frac{2}{5}$. Do you agree with her? Explain how Sally's thinking is different from the way the number line is marked with $\frac{2}{5}$.

c. If you label marks for $\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$, $\frac{4}{10}$, $\frac{5}{10}$, $\frac{6}{10}$, $\frac{7}{10}$, $\frac{8}{10}$, $\frac{9}{10}$, and $\frac{10}{10}$ on Erin's number line, which marks now have more than one label? Why is this?

d. If you were to extend your number line to reach from 0 to 2, there would be five fifths for every whole number length. What are some other "for every" statements you can make about a number line from 0 to 2?

編碼：6(h)-2-1-12

對於練習 20-24，判斷該陳述是否正確。用文字或畫圖解釋你的推理。

$\frac{1}{3} = \frac{4}{12}$ 無情境

For Exercises 12–15, decide whether the statement is correct or incorrect. Explain your reasoning in words or by drawing pictures.

12. $\frac{1}{3} = \frac{4}{12}$

編碼：6(h)-2-1-13

(如編碼：6(h)-2-1-12 之題幹)

$\frac{4}{6} = \frac{2}{3}$ 無情境

For Exercises 12–15, decide whether the statement is correct or incorrect. Explain your reasoning in words or by drawing pictures.

12. $\frac{1}{3} = \frac{4}{12}$

編碼：6(h)-2-1-14

(如編碼：6(h)-2-1-12 之題幹)

$\frac{2}{5} = \frac{1}{3}$ 無情境

For Exercises 12–15, decide whether the statement is correct or incorrect. Explain your reasoning in words or by drawing pictures.

14. $\frac{2}{5} = \frac{1}{3}$

編碼：6(h)-2-1-15

(如編碼：6(h)-2-1-12 之題幹)

$\frac{2}{5} = \frac{5}{10}$ 無情境

For Exercises 12–15, decide whether the statement is correct or incorrect. Explain your reasoning in words or by drawing pictures.

15. $\frac{2}{5} = \frac{5}{10}$

編碼：6(h)-2-1-16

對於練習 24 和 25，使用分數條在數軸上做標記，以表明這兩個分數相等
2/5,6/15 無情境

For Exercises 16 and 17, use fraction strips to make marks on a number line to show that the two fractions are equivalent.

16. $\frac{2}{5}$ and $\frac{6}{15}$

編碼：6(h)-2-1-17

(如編碼：6(h)-2-1-16 之題幹)

1/9, 2/18 無情境

For Exercises 16 and 17, use fraction strips to make marks on a number line to show that the two fractions are equivalent.

17. $\frac{1}{9}$ and $\frac{2}{18}$

編碼：6(h)-2-1-18

給朋友寫一篇解釋，告訴他如何找到等於 $\frac{3}{5}$ 的分數。您可以使用文字和圖片來幫助解釋。個人情境

18. Write an explanation to a friend telling how to find a fraction that is equivalent to $\frac{3}{5}$. You can use words and pictures to help explain.

編碼：6(h)-2-1-19(A, B)

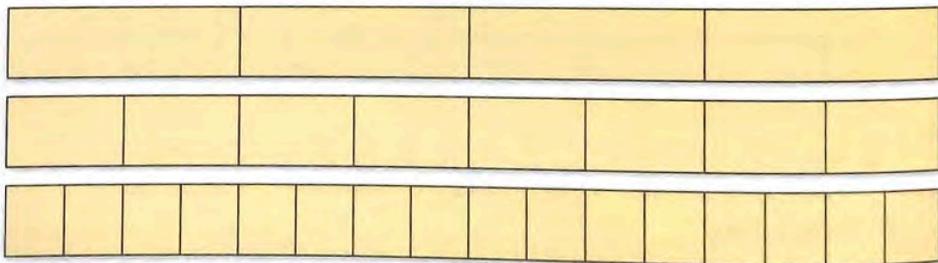
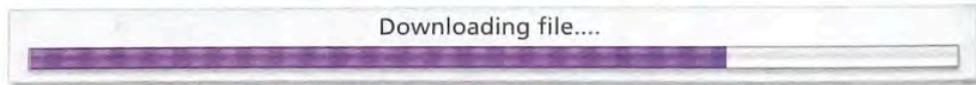
當您保存或下載文件、加載程序或在 Internet 上打開頁面時，計算機屏幕上會顯示狀態欄，讓您查看進度。

(A) 使用顯示的分數條找到描述的三個分數正在進行的工作的狀態。個人情境

(B) 假設您正在下載文件大小為 2.8GB（千兆字節）。如果上面的狀態欄顯示了多少電影已下載，目前已下載多少 GB？個人情境

19. When you save or download a file, load a program, or open a page on the Internet, a status bar is displayed on the computer screen to let you watch the progress.

- a. Use the fraction strips shown to find three fractions that describe the status of the work in progress.



- b. Suppose that you are downloading a movie with a file size of 2.8 GB (gigabyte). If the status bar above indicates how much of the movie has been downloaded, how many gigabytes have been downloaded so far?

編碼：6(h)-2-1-20

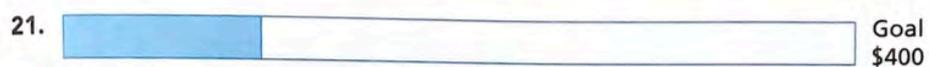
使用分數條找到這些數字並將其標記在數軸：0, $\frac{3}{4}$, $\frac{7}{8}$ 。然後用你的分數條來測量 $\frac{3}{4}$ 和 $\frac{7}{8}$ 之間的距離。無情境

- 20.** Use your fraction strips to locate and label these numbers on a number line: 0, $\frac{3}{4}$, and $\frac{7}{8}$. Then use your fraction strips to measure the distance between $\frac{3}{4}$ and $\frac{7}{8}$.

編碼：6(h)-2-1-21

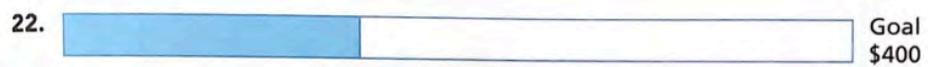
對於練習 21 和 22，折疊新的分數條或使用其他方法來估計陰影的部分籌款溫度計的分數。無情境

For Exercises 21 and 22, fold new fraction strips or use some other method to estimate the fraction of the fundraising thermometer that is shaded.



編碼：6(h)-2-1-22

(如編碼：6(h)-2-1-21 之題幹) 無情境



編碼：6(h)-2-1-23(A, B, C, D)

對於練習 23-27，請使用飲料機的插圖。分配器正面的計量表顯示分配器中剩餘的液體量。分配器可容納 120 個杯子。

- (A) 分配器中大約有多少部分充滿了液體？個人情境
- (B) 分配器中大約有多少杯液體？個人情境
- (C) 分配器大約有多少部分是空的？個人情境
- (D) 大約還需要多少杯液體才能裝滿分配器？個人情境

For Exercises 23–27, use this illustration of a drink dispenser. The gauge on the front of the dispenser shows how much of the liquid remains in the dispenser. The dispenser holds 120 cups.

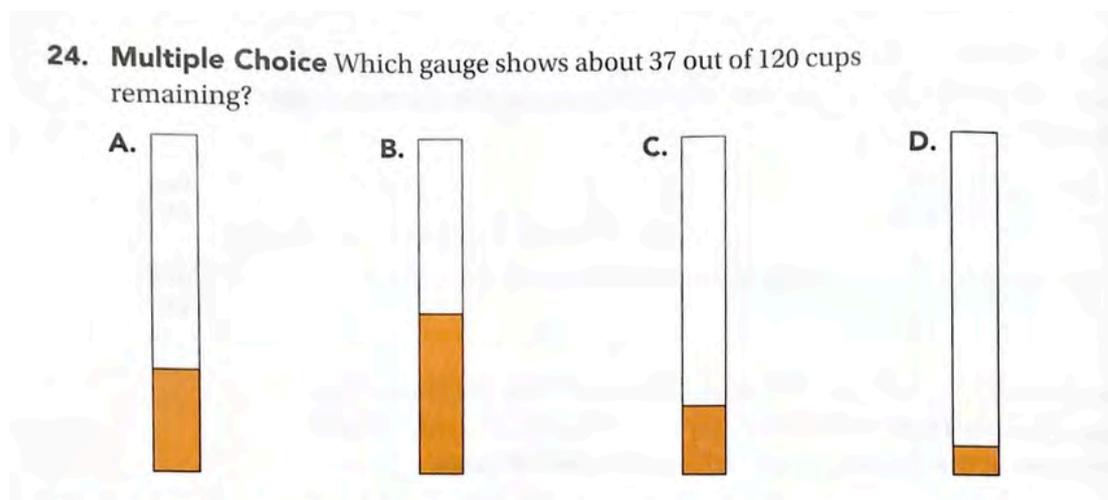


23. a. About what fraction of the dispenser is filled with liquid?
b. About how many cups of liquid are in the dispenser?
c. About what fraction of the dispenser is empty?
d. About how many more cups of liquid would it take to fill the dispenser?

編碼：6(h)-2-1-24

(如編碼：6(h)-2-1-23(A, B, C, D)之題幹)

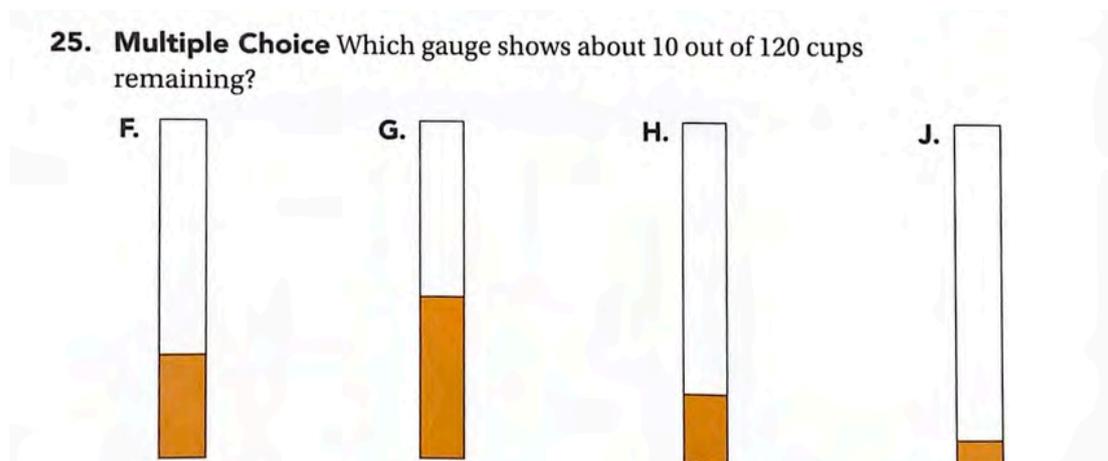
(多選) 哪個儀表顯示中還剩下 120 分之 37 個杯子？無情境



編碼：6(h)-2-1-25

(如編碼：6(h)-2-1-23(A, B, C, D)之題幹)

(多選) 哪個儀表顯示中還剩下 120 分之 10 個杯子？無情境



編碼：6(h)-2-1-26

(如編碼：6(h)-2-1-23(A, B, C, D)之題幹)

在練習 33 和 34 中，您選擇的每個量規中的陰影部分大約是多少？無情境

26. In Exercises 24 and 25, about what fraction is shaded in each gauge you chose?

編碼：6(h)-2-1-27(A, B, C)

(如編碼：6(h)-2-1-23(A, B, C, D)之題幹)

對於(a)-(c)部分，畫出計量表的草圖，並針對每個分配器，說出其是否可以最好地描述為幾乎空、大約半滿或幾乎滿。

(A) 滿的分配器的六分之五 個人情境

(B) 滿的分配器的十二分之三 個人情境

(C) 滿的分配器的八分之五 個人情境

27. For parts (a)–(c), sketch the gauge and, for each dispenser, say whether it can be best described as *almost empty*, *about half full*, or *almost full*.

a. five sixths $\left(\frac{5}{6}\right)$ of a full dispenser

b. three twelfths $\left(\frac{3}{12}\right)$ of a full dispenser

c. five eighths $\left(\frac{5}{8}\right)$ of a full dispenser

編碼：6(h)-2-1-28

如果一個班級為 775 美元的籌款目標籌集了 155 美元，那麼怎樣的分數代表他們實現目標的進度？個人情境

28. If a class collects \$155 toward a fundraising goal of \$775, what fraction represents their progress toward their goal?

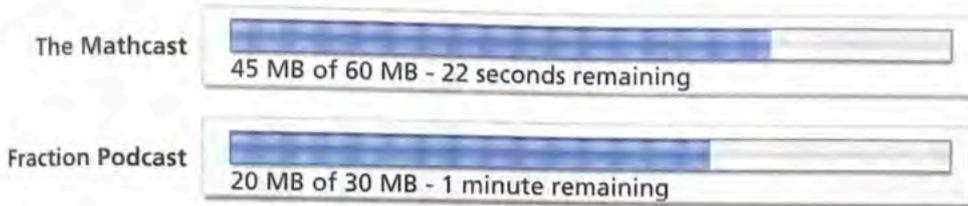
編碼：6(h)-2-1-29

對於練習 29-32，請使用下圖。

克里斯托弗每天下載兩個不同的播客。今天，一個文件的加載速度比另一個文件慢。到目前為止，每個文件已下載了多少部分？**個人情境**

(如編碼：6(h)-2-1-29 之題幹)

For Exercises 29–32, use the graphic below. Christopher downloads two different podcasts each day. Today, one file is loading more slowly than the other.



29. What fraction of each file has downloaded so far?

編碼：6(h)-2-1-30

(如編碼：6(h)-2-1-29 之題幹)

編寫兩個文件大小的比較語句。個人情境

30. Write a comparison statement for the sizes of the two files.

編碼：6(h)-2-1-31

(如編碼：6(h)-2-1-29 之題幹)

為兩個文件的下載部分的大小編寫一個比較語句。個人情境

31. Write a comparison statement for the sizes of the downloaded parts of the two files.

編碼：6(h)-2-1-32

(如編碼：6(h)-2-1-29 之題幹)

每個文件從開始下載到結束需要多長時間？個人情境

32. How long will it take for each file to download, from beginning to end?

編碼：6(h)-2-1-33(A, B, C)

丹、卡里姆和肖恩正在為學校越野隊訓練。有一天，他們報告了自己跑步的距離作為比較聲明。

(A) 丹說他跑的距離是卡里姆的兩倍。給出三種每個人可以跑的距離的可能性。個人情境

(B) 卡里姆說他跑的距離與距離的比值肖恩跑的是 4:3。給出三種可能的可以跑的距離。個人情境

(C) 哪個男孩跑得最遠？個人情境

- 33.** Dan, Karim, and Shawn are training for the school cross-country team. One day, they report the distances they ran as comparison statements.
- Dan says he ran twice as far as Karim. Give three possibilities for the distances each could have run.
 - Karim says that the ratio of the distance he ran to the distance Shawn ran is 4 : 3. Give three possibilities for the distances each could have run.
 - Which boy ran the furthest?

編碼：6(h)-2-1-34(A, B, C, D)

凱特、蘇和麗莎是學校籃球隊的成員。一場比賽結束後，他們將得分報告作為比較報表。

- (A) 凱特和甦的成功投籃次數相同。凱特的成功投籃全部是三分球。蘇成功了投籃全部是2分球。給出三種可能性，說明每種可能性的得分。個人情境
- (B) 麗莎說她的成功投籃次數是甦的兩倍，但是獲得相同數量的分數。這怎麼可能？個人情境
- (C) 哪個女孩得分最高？個人情境
- (D) 哪個女孩投籃次數最多？個人情境

- 34.** Kate, Sue, and Lisa are on the school basketball team. After one game, they report their scoring as comparison statements.
- Kate and Sue made the same number of successful shots as each other. Kate's successful shots were all 3-pointers. Sue's successful shots were all 2-pointers. Give three possibilities for the numbers of points each could have scored.
 - Lisa says that she made twice as many successful shots as Sue but scored the same number of points. How is this possible?
 - Which girl scored the most points?
 - Which girl made the most shots?

編碼：6(h)-2-1-35

對於練習 35-38，請解釋每個問題的答案

450 能被 5、9 和 10 整除嗎？ 無情境

For Exercises 35–38, explain your answer to each question.

35. Is 450 divisible by 5, 9, and 10?

編碼：6(h)-2-1-36

(如編碼：6(h)-2-1-35 之題幹)

12 是 48 的除數嗎？無情境

36. Is 12 a divisor of 48?

編碼：6(h)-2-1-37

(如編碼：6(h)-2-1-35 之題幹)

4 是 150 的除嗎？ 無情境

37. Is 4 a divisor of 150?

編碼：6(h)-2-1-38

(如編碼：6(h)-2-1-35 之題幹)

3 是 51 的除嗎？無情境

38. Is 3 a divisor of 51?

編碼：6(h)-2-1-39

(多選) 選擇不是 300 的因數的數字。

A.5B.6C.8D.20 無情境

39. Multiple Choice Choose the number that is *not* a factor of 300.

A. 5

B. 6

C. 8

D. 20

編碼：6(h)-2-1-40

(多選) 選擇顯示 48 的所有因數的答案。無情境

F. 2、4、8、24 和 48

G. 1、2、3、4、5、6、8 和 12

H. 48、96 和 144

J. 1、2、3、4、6、8、12、16、24 和 48

40. Multiple Choice Choose the answer that shows all of the factors of 48.

F. 2, 4, 8, 24, and 48

G. 1, 2, 3, 4, 5, 6, 8, and 12

H. 48, 96, and 144

J. 1, 2, 3, 4, 6, 8, 12, 16, 24, and 48

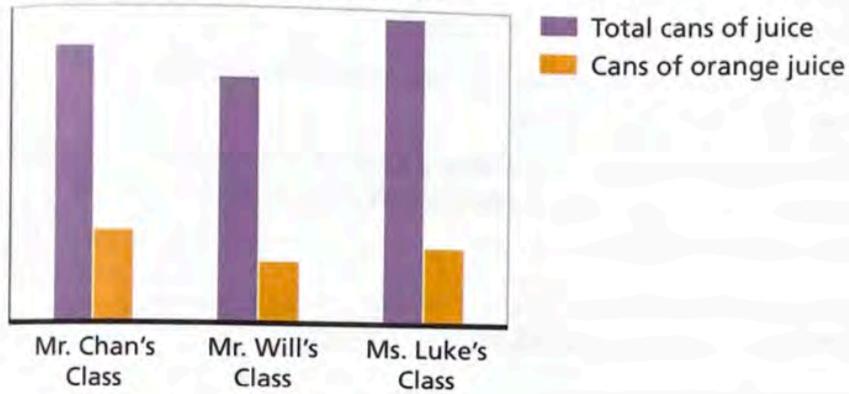
編碼：6(h)-2-1-41

對於練習 41-43，請使用下面的條形圖，其中顯示了三個六年級班級喝的果汁罐數。

在每個班級中，橙汁佔罐裝的比例是多少？**社會情境**

For Exercises 41–43, use the bar graph below, which shows the number of cans of juice three sixth-grade classes drank.

Sixth-Grade Juice Consumption



41. In each class, what fraction of the cans were orange juice?

編碼：6(h)-2-1-42

(如編碼：6(h)-2-1-41 之題幹)

您認為橙汁在哪個班級最受歡迎？社會情境

42. In which class would you say orange juice was most popular?

編碼：6(h)-2-1-43(A, B)

(如編碼：6(h)-2-1-41 之題幹)

(A) 陳老師班上的學生一共喝了十罐橙汁。另外兩個班各喝學生們大約喝了多少罐橙汁？個人情境

(B) 三班同學每人大約喝了多少罐果汁？個人情境

- 43. a.** Students in Mr. Chan's class drank a total of ten cans of orange juice. About how many cans of orange juice did the students in each of the other two classes drink?
- b.** About how many total cans of juice did each of the three classes drink?

編碼：6(h)-2-1-44(A, B)

(A) 米格爾說，你可以輕鬆地將能被 2 整除的數字分成兩等份。你同意？

為什麼或者為什麼不？個人情境

(B) 曼尼說，如果米格爾是正確的，那麼你可以輕鬆地將能被 3 整除的

數字分成三等份。你同意？為什麼或者為什麼不？個人情境

(C) Lupe 說，如果任何數字可以被 n 整除，你可以輕鬆地將它分成 n 個相

等的部分。你同意她的觀點嗎？解釋。個人情境

44. a. Miguel says that you can easily separate numbers divisible by 2 into two equal parts. Do you agree? Why or why not?

b. Manny says that if Miguel is correct, then you can easily separate numbers divisible by 3 into three equal parts. Do you agree? Why or why not?

c. Lupe says that if any number is divisible by n , you can easily separate it into n equal parts. Do you agree with her? Explain.

編碼：6(h)-2-1-45(A, B)

(A) 如果你有一個分數條折疊成十二分之一，你可以用它測量多少分數長度？ 無情境

(B) (a)部分的答案與12的因數有何關係？ 無情境

45. a. If you had a fraction strip folded into twelfths, what fractional lengths could you measure with the strip?
- b. How is your answer in part (a) related to the factors of 12?

編碼：6(h)-2-1-46(A, B)

(A) 如果你將一條分數帶折疊成十分之一，你可以用它測量多少分數長度？無情境

(B) N(a)部分的答案與 10 的因數有何關係？無情境

46. a. If you had a fraction strip folded into tenths, what fractional lengths could you measure with the strip?
- b. How is your answer in part (a) related to the factors of 10?

編碼：6(h)-2-1-47(A, B, C)

Ricky 發現了一隻甲蟲，它的長度是問題 1.3 中使用的分數條的四分之一

(A) 首尾相連的甲蟲屍體總共有多少長度等於分數條的長度嗎？個人情境

(B) 有多少甲蟲屍體首尾相連，其總長度等於三個分數條？個人情境

(C) 瑞奇首尾相連地畫了 13 個紙甲蟲屍體，每個屍體的長度都與他發現的一樣。瑞奇的甲蟲身體線有多長？個人情境

47. Ricky found a beetle that is one fourth $\left(\frac{1}{4}\right)$ the length of the fraction strips used in Problem 1.3.

- a. How many beetle bodies, placed end to end, would have a total length equal to the length of a fraction strip?
- b. How many beetle bodies, placed end to end, would have a total length equal to three fraction strips?
- c. Ricky drew 13 paper beetle bodies, end to end, each the same length as the one he found. How many fraction strips long is Ricky's line of beetle bodies?

編碼：6(h)-2-1-48(A, B, C)

Rachel 查看了 25:30 和 250:300 兩個比率。在每個比率中，她注意到第一個和第二個數字都有一個公因數。

(A) 25 和 30 的公因數有哪些？個人情境

(B) 250 和 300 的公因數有哪些？個人情境

(C) 雷切爾說，比率中的兩個數字總是有一個公因數。她說得對嗎？個人情境

48. Rachel looked at the two ratios 25 : 30 and 250 : 300. In each ratio she noticed that the first and second numbers have a common factor.

a. What are some common factors of 25 and 30?

b. What are some common factors of 250 and 300?

c. Rachel says that the two numbers in a ratio will always have a common factor. Is she correct?

編碼：6(h)-2-1-49(A, B, C)

艾比研究了相同的比率（25:30 和 250:300）。在這兩個等比中，她注意到第一個數字有一個公因數，第二個數字有一個不同的公因數。

(A) 25 和 250 的公因數有哪些？個人情境

(B) 30 和 300 的公因數有哪些？個人情境

(C) 艾比說，兩個等比中的第一個數字總是有一個公因數。她說得對嗎？
個人情境

49. Abby looked at the same ratios (25 : 30 and 250 : 300). In these two equivalent ratios, she noticed that the first numbers have a common factor and the second numbers have a different common factor.

a. What are some common factors of 25 and 250?

b. What are some common factors of 30 and 300?

c. Abby says that the first numbers in two equivalent ratios will always have a common factor. Is she correct?

編碼：6(h)-2-1-50

對於練習 50 和 51，寫一個分數來描述與新鉛筆相比還剩下多少鉛筆。測量從橡皮擦左邊緣到鉛筆尖的距離。個人情境

For Exercises 50 and 51, write a fraction to describe how much pencil is left, compared to a new pencil. Measure from the left edge of the eraser to the point of the pencil.



編碼：6(h)-2-1-51

(同編號：6(h)-2-1-50 之題幹) 個人情境

For Exercises 50 and 51, write a fraction to describe how much pencil is left, compared to a new pencil. Measure from the left edge of the eraser to the point of the pencil.



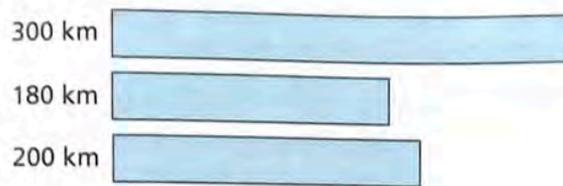
編碼：6(h)-2-1-52(A, B)

這些條代表阿克斯勒女士本週在工作中進行的旅行。

(A) 複製 Axler 女士在每次行程總距離的三分之一後所行進的距離中的每個條形和陰影。個人情境

(B) 當阿克斯勒女士到達每次行程的三分之一點時，她行駛了多少公里？解釋你的推理。個人情境

52. These bars represent trips that Ms. Axler took in her job this week.



- Copy each bar and shade in the distance Ms. Axler traveled after going one third of the total distance for each trip.
- How many kilometers had Ms. Axler traveled when she was at the one-third point in each trip? Explain your reasoning.

編碼：6(h)-2-1-53(A, B, C)

布雷特和吉姆報名參加他們鎮上的陣亡將士紀念日比賽。本次比賽有兩個不同的項目，5K（5公里）和10K（10公里）。布雷特報名參加了5K比賽，吉姆報名參加了10K。

(A) 製作分數條，其中布雷特和吉姆的每公里跑步都被劃分為等長度的分數條。個人情境

(B) 使用溫度計來指示布雷特和吉姆何時完成比賽。此時每個人跑了多少公里？個人情境

(C) 使用溫度計來指示布雷特和吉姆何時完成四公里的比賽。哪個分數代表他們各自的種族數量完成的？個人情境

(D) 寫一個「對於每個」聲明，將布雷特和吉姆跑的距離與他們的距離目標聯繫起來。個人情境

- 53.** Brett and Jim sign up to run in the Memorial Day race in their town. There are two different events at this race, a 5K (5 kilometers) and a 10K (10 kilometers). Brett signed up for the 5K and Jim signed up for the 10K.
- Make fraction strips where each kilometer run is partitioned on equal length fraction strips for both Brett and Jim.
 - Use thermometers to indicate when both Brett and Jim have finished $\frac{3}{5}$ of their races. How many kilometers has each person run at this point?
 - Use the thermometers to indicate when both Brett and Jim are finished with four kilometers of their races. What fraction represents the amount of their respective races they have finished?
 - Write a “for every” claim that relates the distances Brett and Jim have run to their distance goals.

編碼：6(h)-2-1-54(A, B)

一位短跑運動員以 12.63 秒的時間完成了 100 米比賽。

(A) 如果短跑運動員能夠保持相同的速度，需要多長時間他需要完成一萬米比賽嗎？職業情境

(B) 一位長跑運動員以 37 分 30 秒的成績獲得了 10000 米比賽的第一名。長跑運動員的實際時間與(a)部分中短跑運動員的假設時間之間的時間差是多少？職業情境

- 54.** A sprinter finished a 100-meter race in a time of 12.63 seconds.
- a. If the sprinter were able to keep the same rate of speed, how long would it take him to complete the 10,000-meter race?
 - b. A long-distance runner won first place in the 10,000-meter race with a time of 37 minutes, 30 seconds. What is the time difference between the long-distance runner's actual time and the sprinter's hypothetical time from part (a)?

編碼：6(h)-2-1-55

(多選) 找出以下數字的最小公倍數：3、4、5、6、10 和 15。

A.1 B.15 C.60 D.54,000 無情境

55. Multiple Choice Find the least common multiple of the following numbers: 3, 4, 5, 6, 10, and 15.

A. 1

B. 15

C. 60

D. 54,000

編碼：6(h)-2-1-56

使用練習 55 中的結果。將以下分數寫成都具有相同的分母的分數。

$\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{10}$ $\frac{1}{15}$ 無情境

- 56.** Use what you found in Exercise 55. Write the following fractions in equivalent form, all with the same denominator.

$$\frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{10} \quad \frac{1}{15}$$

編碼：6(h)-2-1-57

對於練習 57-60，找出每對數字的最大公因數。

12 和 48 無情境

For Exercises 57–60, find the greatest common factor of each pair of numbers.

57. 12 and 48

編碼：6(h)-2-1-58

(如編碼：6(h)-2-1-57 之題幹)

6 和 9 無情境

58. 6 and 9

編碼：6(h)-2-1-59

(如編碼：6(h)-2-1-57 之題幹)

24 和 72 無情境

59. 24 and 72

編碼：6(h)-2-1-60

(如編碼：6(h)-2-1-57 之題幹)

18 和 45 無情境

60. 18 and 45

編碼：6(h)-2-1-61

對於練習 61-64，使用練習 57-60 中的答案寫出與給定的每個分數等價的分數。

12/48 無情境

For Exercises 61–64, use your answers from Exercises 57–60 to write a fraction equivalent to each fraction given.

61. $\frac{12}{48}$

編碼：6(h)-2-1-62

(如編碼：6(h)-2-1-61 之題幹)

6/9 無情境

For Exercises 61–64, use your answers from Exercises 57–60 to write a fraction equivalent to each fraction given.

62. $\frac{6}{9}$

編碼：6(h)-2-1-63

(如編碼：6(h)-2-1-61 之題幹)

24/72 無情境

For Exercises 61–64, use your answers from Exercises 57–60 to write a fraction equivalent to each fraction given.

63. $\frac{24}{72}$

編碼：6(h)-2-1-64

(如編碼：6(h)-2-1-61 之題幹)

18/45 無情境

For Exercises 61–64, use your answers from Exercises 57–60 to write a fraction equivalent to each fraction given.

64. $\frac{18}{45}$

編碼：6(h)-2-1-65

對於練習 65-67，為每個分數寫一個分子，使該分數接近 $\frac{1}{2}$ 但不等於 $\frac{1}{2}$ 。
然後，寫出另一個分子，使每個分數接近但大於 1。

■/22 無情境

For Exercises 65–67, write a numerator for each fraction to make the fraction close to, but not equal to, $\frac{1}{2}$. Then, write another numerator to make each fraction close to, but greater than, 1.

65. $\frac{\square}{22}$

編碼：6(h)-2-1-66

(如編碼：6(h)-2-1-65 之題幹)

■/43 無情境

For Exercises 65–67, write a numerator for each fraction to make the fraction close to, but not equal to, $\frac{1}{2}$. Then, write another numerator to make each fraction close to, but greater than, 1.

66. $\frac{\blacksquare}{43}$

編碼：6(h)-2-1-67

(如編碼：6(h)-2-1-65 之題幹)

■/17 無情境

For Exercises 65–67, write a numerator for each fraction to make the fraction close to, but not equal to, $\frac{1}{2}$. Then, write another numerator to make each fraction close to, but greater than, 1.

67. $\frac{\square}{17}$

編碼：6(h)-2-1-68

對於練習 68-70，寫一個分母，使每個分數接近但不等於 $\frac{1}{2}$ 。然後，寫另一個分母，使每個分數接近但大於 1 的分數。

22/■ 無情境

For Exercises 68–70, write a denominator to make each fraction close to, but not equal to, $\frac{1}{2}$. Then, write another denominator to make each fraction close to, but greater than, 1.

68. $\frac{22}{\blacksquare}$

編碼：6(h)-2-1-69

(如編碼：6(h)-2-1-68 之題幹)

43/■ 無情境

For Exercises 68–70, write a denominator to make each fraction close to, but not equal to, $\frac{1}{2}$. Then, write another denominator to make each fraction close to, but greater than, 1.

69. $\frac{43}{\blacksquare}$

編碼：6(h)-2-1-70

(如編碼：6(h)-2-1-68 之題幹)

17/■ 無情境

For Exercises 68–70, write a denominator to make each fraction close to, but not equal to, $\frac{1}{2}$. Then, write another denominator to make each fraction close to, but greater than, 1.

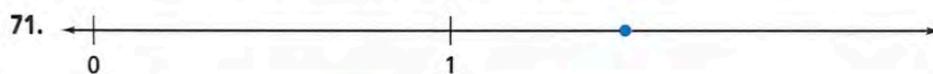
70. $\frac{17}{\blacksquare}$

編碼：6(h)-2-1-71

對於練習 71-74，複製數軸。利用您的分數知識來估計並用分數命名該點。

無情境

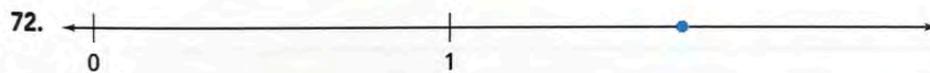
For Exercises 71–74, copy the number line. Use your knowledge of fractions to estimate and name the point with a fraction.



編碼：6(h)-2-1-72

(如編碼：6(h)-2-1-71 之題幹) 無情境

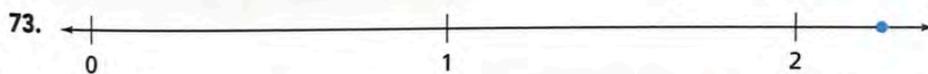
For Exercises 71–74, copy the number line. Use your knowledge of fractions to estimate and name the point with a fraction.



編碼：6(h)-2-1-73

(如編碼：6(h)-2-1-71 之題幹) 無情境

For Exercises 71–74, copy the number line. Use your knowledge of fractions to estimate and name the point with a fraction.



編碼：6(h)-2-1-74

(如編碼：6(h)-2-1-71 之題幹) 無情境

For Exercises 71–74, copy the number line. Use your knowledge of fractions to estimate and name the point with a fraction.



編碼：6(h)-2-1-75

對於練習 75-80，複製數軸。估計並標記數字 1 在每條數軸上的位置。無情境

For Exercises 75–80, copy the number line. Estimate and mark where the number 1 belongs on each number line.



編碼：6(h)-2-1-76

(如編碼：6(h)-2-1-75 之題幹) 無情境

For Exercises 75–80, copy the number line. Estimate and mark where the number 1 belongs on each number line.



編碼：6(h)-2-1-77

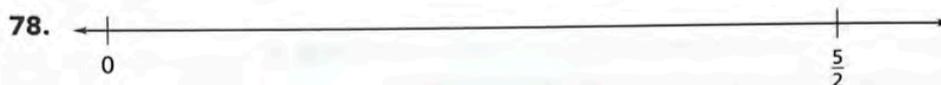
(如編碼：6(h)-2-1-75 之題幹) 無情境

For Exercises 75–80, copy the number line. Estimate and mark where the number 1 belongs on each number line.

編碼：6(h)-2-1-78

(如編碼：6(h)-2-1-75 之題幹) 無情境

For Exercises 75–80, copy the number line. Estimate and mark where the number 1 belongs on each number line.



編碼：6(h)-2-1-79

(如編碼：6(h)-2-1-75 之題幹) 無情境

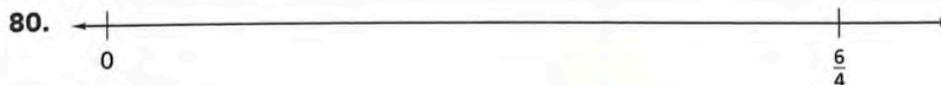
For Exercises 75–80, copy the number line. Estimate and mark where the number 1 belongs on each number line.



編碼：6(h)-2-1-80

(如編碼：6(h)-2-1-75 之題幹) 無情境

For Exercises 75–80, copy the number line. Estimate and mark where the number 1 belongs on each number line.



編碼：6(h)-2-1-81(A, B, C)

達里奧做了三個披薩，然後將其切成四等分。考慮到要與多少人分享後，他心想：「每人可以分一半。」

- (A) 有沒有可能只有一個人可以分享？解釋。個人情境
- (B) 達里奧有可能與另外 5 個人分享披薩嗎？解釋。個人情境
- (C) 達里奧有可能與其他 11 個人分享披薩嗎？解釋。個人情境

- 81.** Dario made three pizzas, which he sliced into quarters. After considering how many people he would be sharing with, he thought to himself, "Each person can have half."
- a.** Is it possible that there was only one other person to share with? Explain.
 - b.** Is it possible that Dario was sharing the pizzas with 5 other people? Explain.
 - c.** Is it possible that Dario was sharing the pizzas with 11 other people? Explain.

編碼：6(h)-2-1-82

在問題 1.5 中，八級溫度計比六級和七級溫度計小。重新繪製八級溫度計，使其大小與六級和七級溫度計相同，但仍顯示第 10 天的正確分數。個人情境

- 82.** In Problem 1.5, the eighth-grade thermometer is smaller than the sixth- and seventh-grade thermometers. Redraw the eighth-grade thermometer so that it is the same size as the sixth- and seventh-grade thermometers, but still shows the correct fraction for Day 10.

編碼：6(h)-2-2-1

展示三個人分享 5 段耐嚼水果蟲軟糖的兩種方法。個人情境

1. Show two ways three people can share a 5-segment chewy fruit worm.

編碼：6(h)-2-2-2

展示五個人分享 3 段耐嚼水果蟲軟糖的兩種方法。個人情境

2. Show two ways five people can share a 3-segment chewy fruit worm.

編碼：6(h)-2-2-3(A, B)

Sharon 準備好分享下圖所示的 4 段耐嚼水果蟲軟糖。她已經做了她需要的標記，這樣她就可以在她的小組成員之間平等分享。

(A) 給出可能屬於莎倫小組的兩個不同人數。個人情境

(B) 對於 (a) 部分中給出的每個答案，寫下一個比率，將共享耐嚼水果蟲軟糖的人數與他們共享的片段數進行比較。您如何將其改寫為單位費率？個人情境

- 3.** Sharon is ready to share the 4-segment chewy fruit worm shown below. She has already made the marks she needs so that she can share it equally among the members of her group.



- Give two different numbers of people that could be in Sharon's group.
- For each answer you gave in part (a), write a ratio comparing the number of people sharing a chewy fruit worm to the number of segments they are sharing. How would you rewrite this as a unit rate?

編碼：6(h)-2-2-4

謝麗爾、麗塔和四個朋友去看電影，平分一袋 48 盎司的爆米花和三個 48 英寸的甘草花邊。寫出爆米花盎司數與朋友數量的比率。然後，寫出比較每個人甘草花邊長度的單位比率。個人情境

4. Cheryl, Rita, and four of their friends go to a movie and share a 48-ounce bag of popcorn equally and three 48-inch licorice laces equally. Write a ratio comparing the number of ounces of popcorn to the number of friends. Then, write a unit rate comparing the length of licorice lace for each person.

編碼：6(h)-2-2-5

拉普人買了三個大三明治在野餐時享用。九個人來參加野餐。展示三種不同的三明治切法，以便每個人都能得到平等的份額。個人情境

5. The Lappans buy three large sandwiches to serve at a picnic. Nine people come to the picnic. Show three different ways to cut the sandwiches so that each person gets an equal share.

編碼：6(h)-2-2-6

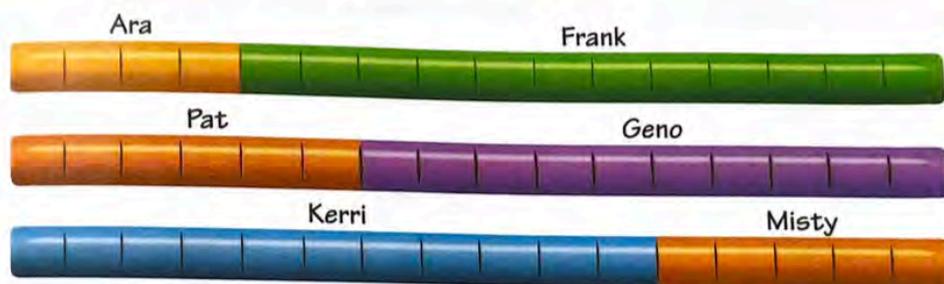
三個鄰居共用一塊長方形的土地作為花園。他們把土地分成 24 塊大小相等的塊。他們每個人都獲得相同數量的土地。寫出土地數量與人口數量的比率。用不止一種方式寫出答案。社會情境

- 6.** Three neighbors are sharing a rectangular strip of land for a garden. They divide the land into 24 equal-sized pieces. They each get the same amount of land. Write a ratio comparing the number of pieces of land to the number of people. Write the answer in more than one way.

編碼：6(h)-2-2-7

對於下面的每條耐嚼水果蟲軟糖，請按年齡寫出共用該蟲的兩個人的可能年齡。個人情境

7. For each chewy fruit worm below write the possible ages of the two people sharing the worm by age.



編碼：6(h)-2-2-8

使用此信息進行練習 8-10。在問題 2.2 的生日聚會上，孩子們進行接力賽。每個隊員跑的距離取決於他們的年齡比例。例如，一個男孩的年齡是女孩的兩倍，他跑的距離是女孩的兩倍。

Crystal 12 歲，Alexa 6 歲。如果 Crystal 跑 100 碼，Alexa 跑多遠？他們總共跑了多遠？**個人情境**

Use this information for Exercises 8–10. At the birthday party in Problem 2.2, the children run relay races. The distance each team member runs depends on the ratio of their ages. For example, a boy who is twice as old as a girl runs twice as far.

8. Crystal is 12 years old and Alexa is 6 years old. If Crystal runs 100 yards, how far does Alexa run? How far do they run altogether?

編碼：6(h)-2-2-9

(如編碼：6(h)-2-2-8 之題幹)

Crystal 12 歲，Alexa 6 歲。如果 Crystal 跑 100 碼，Alexa 跑多遠？他們總共跑了多遠？**個人情境**

Use this information for Exercises 8–10. At the birthday party in Problem 2.2, the children run relay races. The distance each team member runs depends on the ratio of their ages. For example, a boy who is twice as old as a girl runs twice as far.

9. Jared is 10 years old and Peter is 15 years old. Together, they run 150 yards. How far does each brother run?

編碼：6(h)-2-2-10

(如編碼：6(h)-2-2-8 之題幹)

韋恩和艾美特是兄妹。韋恩跑了 180 碼。埃米特跑了 120 碼。他們每個人可能有多大年紀？**個人情境**

Use this information for Exercises 8–10. At the birthday party in Problem 2.2, the children run relay races. The distance each team member runs depends on the ratio of their ages. For example, a boy who is twice as old as a girl runs twice as far.

- 10.** Wynne and Emmett are brother and sister. Wynne runs 180 yards. Emmett runs 120 yards. How old could each of them be?

編碼：6(h)-2-2-11

使用此信息進行練習 11-14。父母比孩子年長。父母的年齡與孩子的年齡之比隨著年齡的增長而變化父母和孩子都會變老。

父母的年齡可以是孩子的兩倍嗎？解釋。個人情境

Use this information for Exercises 11–14. Parents are older than their children. The ratio of a parent’s age to a child’s age changes as the parent and child get older.

11. Can a parent ever be exactly twice as old as his or her child? Explain.

編碼：6(h)-2-2-12

(如編碼：6(h)-2-2-11 之題幹)

父母的年齡可以是孩子的三倍嗎？解釋。個人情境

Use this information for Exercises 11–14. Parents are older than their children. The ratio of a parent's age to a child's age changes as the parent and child get older.

12. Can a parent ever be exactly three times as old as his or her child? Explain.

編碼：6(h)-2-2-13

(如編碼：6(h)-2-2-11 之題幹)

父母的年齡與孩子的年齡之比可以正好是 3:2 嗎？解釋。 個人情境

Use this information for Exercises 11–14. Parents are older than their children. The ratio of a parent's age to a child's age changes as the parent and child get older.

13. Can the ratio of a parent's age to his or her child's age ever be exactly 3 : 2? Explain.

編碼：6(h)-2-2-14

(如編碼：6(h)-2-2-11 之題幹)

父母的年齡與孩子的年齡之比可以正好是 10:9 嗎？解釋。個人情境

Use this information for Exercises 11–14. Parents are older than their children. The ratio of a parent's age to a child's age changes as the parent and child get older.

14. Can the ratio of a parent's age to his or her child's age ever be exactly 10 : 9? Explain.

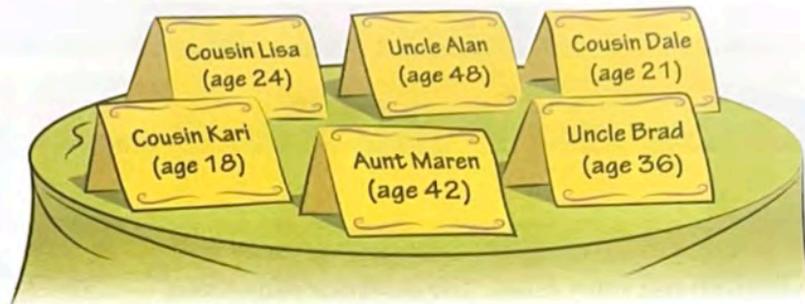
編碼：6(h)-2-2-15(A, B)

Crystal 和 Alexa 說服家裡的年長成員根據年齡比例分解耐嚼的水果蟲軟糖。他們想知道哪些家庭成員的年齡比例與 Crystal 和 Alexa 相同。

(A) 使用家庭成員的年齡來查找與 Crystal (12 歲) 和 Alexa (6 歲) 年齡比例相同的配對。個人情境

(B) 你在(a)部分中寫的所有比率有什麼共同點？ 個人情境

15. Crystal and Alexa convince the older members of their family to break up the chewy fruit worms using age ratios. They want to know which family members have the same age ratio as Crystal and Alexa.
- a. Use the ages of their family members to find pairs that have the same age ratio as Crystal (age 12) and Alexa (age 6).



- b. What do all the ratios that you wrote in part (a) have in common?

編碼：6(h)-2-2-16

(如編碼：6(h)-2-2-16 之題幹)

對於練習 16-18，複製並完成表格，比較每個家庭成員收到的耐嚼蟲水果堂部分。說明每次比較中的兩個單位費率。個人情境

For Exercises 16–18, copy and complete the table comparing the chewy fruit worm segments each family member received. State both unit rates in each comparison.

16.

Segments for Alan	48	12	■	1	■	7
Segments for Lisa	24	■	8	■	1	■

編碼：6(h)-2-2-17

(如編碼：6(h)-2-2-16 之題幹) 個人情境

For Exercises 16–18, copy and complete the table comparing the chew fruit worm segments each family member received. State both unit rates in each comparison.

17.

Segments for Lisa	24	12	■	1	■	■
Segments for Crystal	6	■	2	■	1	$1\frac{1}{2}$

編碼：6(h)-2-2-18

(如編碼：6(h)-2-2-16 之題幹) 個人情境

For Exercises 16–18, copy and complete the table comparing the chew fruit worm segments each family member received. State both unit rates in each comparison.

18.

Segments for Alan	48	24	■	1	■	■
Segments for Crystal	6	■	2	■	1	$1\frac{1}{2}$

編碼：6(h)-2-2-19

對於練習 19-22，使用練習 15 中的家庭成員，包括 Crystal 和 Alexa。確定哪兩個人各有年齡比例，

單位比率為 2:1。個人情境

For Exercises 19–22, use the family members from Exercise 15, including Crystal and Alexa. Determine which two people have each age ratio.

19. The unit rate is 2 : 1.

編碼：6(h)-2-2-20

(如編碼：6(h)-2-2-19 之題幹)

單位比率為 4 : 1。個人情境

For Exercises 19–22, use the family members from Exercise 15, including Crystal and Alexa. Determine which two people have each age ratio.

20. The unit rate is 4 : 1.

編碼：6(h)-2-2-21

(如編碼：6(h)-2-2-19 之題幹)

分段 (年齡) 比例為 3:4 個人情境

For Exercises 19–22, use the family members from Exercise 15, including Crystal and Alexa. Determine which two people have each age ratio.

21. The ratio of segments (ages) is 3 : 4.

編碼：6(h)-2-2-22

(如編碼：6(h)-2-2-19 之題幹)

分段 (年齡) 比例為 3:2。個人情境

For Exercises 19–22, use the family members from Exercise 15, including Crystal and Alexa. Determine which two people have each age ratio.

22. The ratio of segments (ages) is 3 : 2.

編碼：6(h)-2-2-23(A, B, C)

對於練習 23 和 24，Rosco 正在為家人計劃膳食。他使用垂直率表。

(A) 填寫通心粉和奶酪配料的比例表。個人情境

(B) 7 杯奶酪需要多少盎司通心粉？個人情境

(C) 88 盎司需要多少杯奶酪通心粉？個人情境

For Exercises 23 and 24, Rosco is planning meals for his family. He uses the vertical rate tables.

23. a. Complete the rate table for the macaroni and cheese ingredients.

Macaroni and Cheese

Ounces of Macaroni	Cups of Cheese
8	1
■	2
■	3
■	4
■	5
■	6

- b.** How many ounces of macaroni would you need for 7 cups of cheese?
- c.** How many cups of cheese would you need for 88 ounces of macaroni?

編碼：6(h)-2-2-24(A, B, C)

(A) 填寫意大利面配料的費率表。個人情境

(B) 將 2 盎司西紅柿與 1 盎司意大利面進行比較，單位比率是多少？個人情境

(C) 將 1 盎司西紅柿與 2 盎司意大利面進行比較，單位比率是多少？個人情境

24. a. Complete the rate table for the spaghetti ingredients.

Spaghetti and Sauce

Ounces of Spaghetti	Ounces of Tomatoes
12	16
6	8
3	■
2	■
1	■

b. What is the unit rate comparing the number of ounces of tomatoes to 1 ounce of spaghetti?

c. What is the unit rate comparing 1 ounce of tomatoes to the number of ounces of spaghetti?

編碼：6(h)-2-2-25

烏蘇拉、烏巴爾多、尤利西斯和朵拉試圖想出不同的方法，將一條 10 段耐嚼水果蟲分給四人。這些策略中哪一個會導致平等分享？

烏蘇拉的策略：給每個人兩段，然後將剩下的兩段分成四等份，每個人得到另一半段。

烏巴爾多的策略：給每個人一段，然後如果至少還剩下四段，則給每個人另一段。重複這個過程，直到少於四塊，然後將剩下的塊切成四等份，給每人一份。

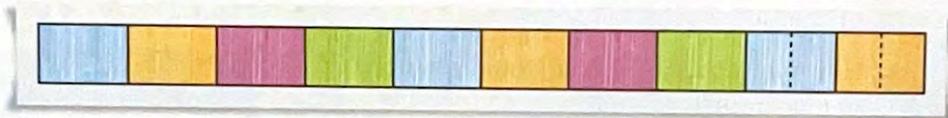
尤利西斯的策略：給每個人兩個部分，然後使用旋轉器選出額外兩個部分的獲勝者。

朵拉的策略：忘記片段。只需將蠕蟲切成兩半，然後再將每一半切成兩半。個人情境

25. Ursula, Ubaldo, Ulysses, and Dora were trying to come up with different ways to divide a 10-segment chewy fruit worm among the four of them. Which of these strategies would result in sharing equally?

- Ursula's Strategy:

Give everyone two segments, and then divide the remaining two segments into four equal pieces with each person getting another half of a segment.



- Ubaldo's Strategy:

Give each person one segment, then if there's at least four segments left, give each person another segment. Repeat this process until there are less than four segments, then cut the leftover pieces into four equal parts and give each person a part.

- Ulysses' Strategy:

Give each person two segments, and then use a spinner to pick the winner of the extra two segments.

- Dora's Strategy:

Forget about the segments. Just cut the worm in half, and then cut each half in half again.

編碼：6(h)-2-2-26

如果你要在耐嚼的水果蟲上做分段標記如果沒有任何標記，使用素數段的優點或缺點是什麼？**個人情境**

- 26.** If you were going to make segment marks on a chewy fruit worm without any marks, what would be the advantage or disadvantage of using a prime number of segments?

編碼：6(h)-2-2-27(A, B, C)

一個典型的濃縮橙汁容器可容納 12 液體盎司（液量盎司）。標準配方是「將一罐濃縮液與三罐冷水混合」

(A) 濃縮液與水的比例是多少？個人情境

(B) 您需要多大的容器來容納果汁？個人情境

(C) 奧利維亞有一個一加侖的容器來裝橙汁。她使用標準食譜。她需要多少濃縮檸檬水？（一加侖為 128 液量盎司。）個人情境

27. A typical container of orange juice concentrate holds 12 fluid ounces (fl oz). The standard recipe is "Mix one can of concentrate with three cans of cold water."

a. What is the ratio of concentrate to water?

b. How large of a container will you need to hold the juice?

c. Olivia has a one-gallon container to fill with orange juice. She uses the standard recipe. How much concentrate does she need? (One gallon is 128 fl oz.)

編碼：6(h)-2-2-28(A, B, C)

一個典型的濃縮檸檬水容器可容納 12 液體盎司。標準配方是「將一罐濃縮液與 4 罐濃縮液混合」冷水。

(A) 濃縮液與水的比例是多少？個人情境

(B) 您需要多大的容器來盛檸檬水？個人情境

(C) 奧利維亞有一個一加侖的容器來裝檸檬水。她使用標準食譜。她需要多少濃縮檸檬水？（一加侖為 128 液量盎司。）個人情境

28. A typical container of lemonade concentrate holds 12 fl oz. The standard recipe is "Mix one can of concentrate with $4\frac{1}{3}$ cans of cold water."

a. What is the ratio of concentrate to water?

b. How large of a container will you need to hold the lemonade?

c. Olivia has a one-gallon container to fill with lemonade. She uses the standard recipe. How much concentrate does she need?
(One gallon is 128 fl oz.)

編碼：6(h)-2-2-29(A, B)

Langhus 便利店出售多種尺寸的耐嚼水果蟲。貝特西、艾米麗和約翰正在嘗試決定哪一項交易能讓他們以同樣的價格獲得最耐嚼的水果蟲軟糖。

(A) 你認為哪種論證最好？解釋。

Betsy：小號是最好的選擇，因為你得到的蠕蟲數量最多，比中號多 10 條，多 18 條比大尺寸。

約翰：大尺寸是最好的選擇，因為總體來說你需要支付的錢最少。

Emily：我用了 4、8 和 12 的最小公倍數，即 24。用 24 美元，我可以買 60 條大型蠕蟲、54 條中型蠕蟲和 56 條小蟲子。大尺寸是最好的選擇。

個人情境

(B) 貝特西、約翰和艾米麗如何使用單位費率來找到最划算的價錢？
個人情境

29. Langhus Convenience Store sells multiple sizes of chewy fruit worms. Betsy, Emily, and John are trying to decide which of the deals would give them the most chewy fruit worms for the price.



- a. Which argument do you think is the best? Explain.
- Betsy: The small size is the best deal because you get the most amount of worms, 10 more than the medium size, and 18 more than the large size.
 - John: The large size is the best deal because you have to pay the least amount of money overall.
 - Emily: I used the least common multiple of 4, 8, and 12, which is 24. For \$24, I could buy 60 large worms, 54 medium worms, and 56 small worms. The large size is the best deal.
- b. How could Betsy, John, and Emily use unit rates to find the best deal?

編碼：6(h)-2-2-30

當約翰在練習 16-24 中研究單位比率時，他注意到一些有趣的事情，並對他的老師說：「每當你比較兩個數量並寫下兩個單位比率時，其中至少有一個會包含分數。」約翰正確嗎？解釋為什麼你同意或不同意他的觀點。個人情境

30. As Johann is working on unit rates in Exercises 16–24, he notices something interesting and says to his teacher, “Whenever you compare two quantities and you write both unit rates, at least one of them will have a fraction in it.” Is Johann correct? Explain why you agree or disagree with him.

編碼：6(h)-2-2-31

(如編碼：6(h)-2-2-31 之題幹)

對於練習 31-33，請考慮 Jena 在解決問題 2.1 時所做的猜想。你認為哪些猜想是正確的？解釋。

如果人數大於分段數，則每人人將獲得少於一節。個人情境

For Exercises 31–33, consider the conjectures Jena made while working on Problem 2.1. Which conjectures do you think are true? Explain.

31. If the number of people is greater than the number of segments, each person will get less than one segment.

編碼：6(h)-2-2-32

(如編碼：6(h)-2-2-31 之題幹)

至少有兩種方法可以分割任何耐嚼的水果蟲軟糖，以便每個人都會得到相同的。**個人情境**

For Exercises 31–33, consider the conjectures Jena made while working on Problem 2.1. Which conjectures do you think are true? Explain.

32. There are at least two ways to divide any chewy fruit worm so that everyone will get the same amount.

編碼：6(h)-2-2-33

(如編碼：6(h)-2-2-31 之題幹)

如果人與段的比例是 1:2，那麼每個人都會得到一個段。 個人情境

For Exercises 31–33, consider the conjectures Jena made while working on Problem 2.1. Which conjectures do you think are true? Explain.

33. If the ratio of people to segments is 1 : 2, then each person will get $\frac{1}{2}$ of a segment.

編碼：6(h)-2-2-34

哈羅德比梅納德大八歲。在哈羅德十六歲生日那天，他注意到他們的年齡比例有些有趣。他說：「當我九歲的時候，我和哈羅德的年齡比是 9:1。一年後，這個比例是 5:1。那時我十歲，梅納德兩歲。現在在我十六歲生日時，我梅納德的年齡是梅納德的兩倍，這意味著我們的年齡比是 2:1。」哈羅德和梅納德的年齡比會是 1:1 嗎？解釋。個人情境

- 34.** Harold is eight years older than Maynard. On Harold's sixteenth birthday, he notices something interesting about their age ratios. He says, "When I was nine, the ratio of my age to Harold's was 9 : 1. A year later the ratio was 5 : 1. That's when I was ten and Maynard was two. Now on my sixteenth birthday, I'm twice as old as Maynard, which means the ratio of our ages is 2 : 1." Will Harold and Maynard ever have an age ratio 1 : 1? Explain.

編碼：6(h)-2-2-35

女子 4×100 米混合泳接力隊獲得第二名。在接力賽中，每位隊員使用不同的泳姿遊 100 米。團隊成員的年齡分別為 21 歲、22 歲、25 歲和 41 歲。這個年齡組中最年長和最年輕的游泳運動員之間相差了 20 歲！假設他們按照年齡劃分了 400 米的距離，如問題 2.2 所示。接力賽中每人會遊多遠？**社會情境**

35. A women's 4-by-100 meter medley relay team finished in second place. In the relay, each member swims 100 meters using a different stroke. The ages of the team members are 21, 22, 25, and 41.

The age difference between the oldest and youngest swimmer on this team was 20 years!

Suppose they had broken up the distance of 400 meters by age as in Problem 2.2. How far would each person swim in the relay?

編碼：6(h)-2-2-36

Mirasola 先生向 Mariette、Melissa 和 Michelle 提出了問題 2.3 的後續問題：

「如果您有 13.75 美元，您可以購買多少條大型耐嚼水果蟲軟糖？」

Mariette 說她可以買 5 又 1/2 個。

Melissa 說她只能買 5 個。

米歇爾說她只能買 4 個。

米拉索拉先生說：「你們都是對的，這取決於你們對廣告的看法。」它們怎樣可能都是正確的呢？**個人情境**

36. Mariette, Melissa, and Michelle were given this follow-up question by Mr. Mirasola to Problem 2.3, "If you had \$13.75, how many large chewy fruit worms could you buy?"

- Mariette said that she could buy $5\frac{1}{2}$.
- Melissa said that she could buy only 5.
- Michelle said that she could buy only 4.

Mr. Mirasola said, "You are all correct depending on how you think of the ad." How is it possible that they could all be correct?

編碼：6(h)-2-2-37(A, B)

在最近的一次加拿大之行中，托馬斯了解到美元和加元之間存在「匯率」。當他兌換美元時，他沒有換回同等數量的加元。托馬斯希望有一天能夠訪問許多不同的國家，因此他做了一些研究並找到了一個網站，上面有一些基本的貨幣換算。

(A) 查找下面每個國家/地區的單位費率。個人情境

注意：匯率每天都會發生變化；有些網站提供最新的匯率。

(B) 如何使用此信息將歐元轉換為澳大利亞元或瑞士法郎兌換新加坡元？解釋。個人情境

37. On a recent trip to Canada, Tomas learned that there was an “exchange rate” between U.S. dollars and Canadian dollars. When he exchanged his U.S. dollars, he did not get the same number of Canadian dollars back. Tomas hopes to visit many different countries one day, so he does some research and finds a Web site with some basic money conversions on it.

a. Find the unit rate for each country below.

Currency Exchange Rates

\$20 US = 19 Australian Dollars	\$1 US = ■ AUD	\$■ US = 1 AUD
\$5 US = 4 Euros	\$1 US = ■ Euros	\$■ US = 1 Euro
\$50 US = 49 Swiss Francs	\$1 US = ■ SF	\$■ US = 1 SF
\$3 US = 2 Pounds (UK)	\$1 US = ■ Pounds	\$■ US = 1 Pound
\$4 US = 5 Singapore Dollars	\$1 US = ■ SGD	\$■ US = 1 SGD

Note: Exchange rates often change from day to day; there are Web sites that have the most up-to-date exchange rates.

b. How can you use this information to convert euros to Australian dollars or Swiss francs to Singapore dollars? Explain.

5000 Japanese yen,
Ichiyo Higuchi (1872–1896),
writer and poet

10 US dollars,
Andrew Jackson (1767–1845),
seventh President



10 English pounds,
Queen Elizabeth II
(b. 1926)

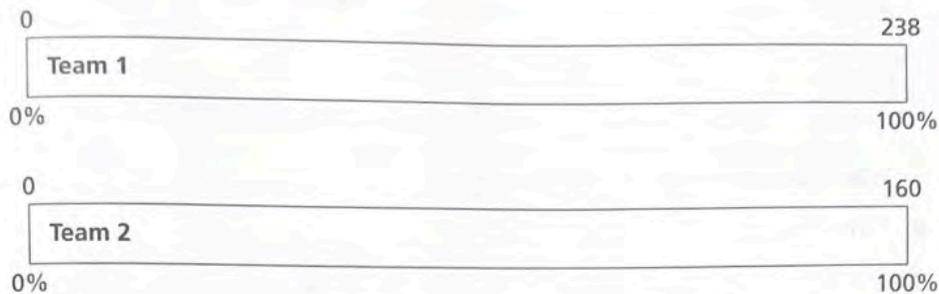
20 Australian dollars,
Mary Reibey (1777–1855),
businesswoman

編碼：6(h)-2-4-1(A, B, C)

最近一年，第一隊罰球 238 次，罰球 191 次；第二隊罰球 160 次，罰球 106 次。複製並使用百分比條來回答每個問題。

- (A) 哪一個分數基準接近每支球隊的罰球次數？職業情境
- (B) 估計每支球隊的罰球命中率本賽季。b.估計每支球隊的罰球命中率本賽季。職業情境
- (C) 如果 1 隊的罰球率不變，那麼 1 隊在接下來的 200 次罰球中將罰球多少次？有多少罰球的在接下來的 20 次投擲中，第 1 隊將投擲多少次？職業情境

1. In a recent year, Team 1 made 191 out of 238 free-throw attempts and Team 2 made 106 out of 160 free-throw attempts. Copy and use the percent bars to answer each question.



- a. What fraction benchmark is close to the number of free throws made by each team?
- b. Estimate the percent of free throws made by each team in the season.
- c. If Team 1's free-throw rate does not change, how many free throws will Team 1 make in the next 200 throws? How many free throws will Team 1 make in the next 20 throws?

編碼：6(h)-2-4-2

(多選) 選擇測驗中的最佳分數。無情境

A. 15 分 (滿分 25 分)

B. 8 分 (滿分 14 分)

C. 25 分 (滿分 45 分)

D. 27 分 (滿分 50 分)

2. Multiple Choice Choose the best score on a quiz.

A. 15 points out of 25

B. 8 points out of 14

C. 25 points out of 45

D. 27 points out of 50

編碼：6(h)-2-4-3

(多選) 選擇測驗中的最佳分數。無情境

F.150 分 (滿分 250 分)

G.24 分 (滿分 42 分)

H.75 分 (滿分 135 分)

J.75 分 (滿分 150 分)

3. Multiple Choice Choose the best score on a quiz.

F. 150 points out of 250

G. 24 points out of 42

H. 75 points out of 135

J. 75 points out of 150

編碼：6(h)-2-4-4

(選擇題) 測驗分數為 14 分 (滿分 20 分) 的正確百分比是多少? 無情境

A. 43%

B. 53%

C. 70%

D. 75%

4. **Multiple Choice** What is the correct percent for a quiz score of 14 points out of 20?

A. 43%

B. 53%

C. 70%

D. 75%

編碼：6(h)-2-4-5

(選擇題) 測驗分數為 26 分 (滿分 60 分) 的正確百分比是多少? 無情境

F. 約 43%

G. 約 57%

H. 約 68%

J. 約 76%

5. Multiple Choice What is the correct percent for a quiz score of 26 points out of 60?

F. about 43%

G. about 57%

H. about 68%

J. about 76%

編碼：6(h)-2-4-6(A, B, C)

對於練習 6-14，請使用下表中的資料。

(A) 貓中雌性的比例是多少？科學情境

(B) 貓中雄性的比例是多少？科學情境

(C) 將每個分數寫成小數和百分比。科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



6. a. What fraction of the cats are female?
b. What fraction of the cats are male?
c. Write each fraction as a decimal and as a percent.

編碼：6(h)-2-4-7(A, B, C)

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

(A) 小貓佔貓的比例是多少？科學情境

(B) 成貓的比例是多少？科學情境

(C) 將每個分數寫成小數和百分比。科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



7. a. What fraction of the cats are kittens?
b. What fraction of the cats are adults?
c. Write each fraction as a decimal and a percent.

編碼：6(h)-2-4-8(A, B)

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

(A) 小貓中雄性的比例是多少？科學情境

(B) 將分數寫成小數和百分比。科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



8. a. What fraction of the kittens are male?
b. Write the fraction as a decimal and as a percent.

編碼：6(h)-2-4-9

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

體重在 11 到 15.9 磅之間的貓佔百分之多少？科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



9. What percent of the cats weigh between 11 and 15.9 pounds?

編碼：6(h)-2-4-10

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

體重在 0 到 5.9 磅之間的貓佔百分之多少？ 科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



10. What percent of the cats weigh between 0 and 5.9 pounds?

編碼：6(h)-2-4-11

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

體重在 11 至 15.9 磅之間的雄性小貓所佔的百分比是多少？科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



11. What percent of the cats are male kittens and weigh between 11 and 15.9 pounds?

編碼：6(h)-2-4-12

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

體重在 6 至 15.9 之間的貓中，有多少是雌性的？科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



12. What percent of the cats are female and weigh between 6 and 15.9 pounds?

編碼：6(h)-2-4-13

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

體重在 16 至 20 之間的貓中，有多少百分比是小貓？科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



13. What percent of the cats are kittens and weigh between 16 and 20 pounds?

編碼：6(h)-2-4-14

(如編碼：6(h)-2-4-6(A, B, C)之題幹)

體重在 0 到 5.9 磅之間的母貓佔百分之幾？ 科學情境

For Exercises 6–14, use the data in the table below.

Distribution of Cat Weights

Weight (lb)	Males		Females	
	Kitten	Adult	Kitten	Adult
0–5.9	8	1	7	4
6–10.9	0	16	0	31
11–15.9	2	15	0	10
16–20	0	4	0	2
Total	10	36	7	47



14. What percent of the female cats weigh between 0 and 5.9 pounds?

編碼：6(h)-2-4-15

對於練習 15-18，請使用以下資訊：在最近的一項調查中，150 名狗主人和 200 名貓主人被問及他們的寵物喜歡什麼類型的食物。以下是調查結果。找出狗狗最喜歡的食物類別（人類、寵物或人類和寵物）。將此類別的資料寫為分數、小數以及佔受調查的狗主人總數的百分比。社會情境

For Exercises 15–18, use the following information: In a recent survey, 150 dog owners and 200 cat owners were asked what type of food their pets liked. Here are the results of the survey.

Preference	Dogs	Cats
Human Food Only	75	36
Pet Food Only	45	116
Human and Pet Food	30	48

15. Find the category of food most favored by dogs (Human, Pet, or Human and Pet). Write the data from this category as a fraction, as a decimal, and as a percent of the total dog owners surveyed.

編碼：6(h)-2-4-16

(如編碼：6(h)-2-4-15 之題幹)

找出貓咪最喜歡的食物類別。將此類別的資料寫為分數、小數以及佔受調查的貓主人總數的百分比。社會情境

For Exercises 15–18, use the following information: In a recent survey, 150 dog owners and 200 cat owners were asked what type of food their pets liked. Here are the results of the survey.

Preference	Dogs	Cats
Human Food Only	75	36
Pet Food Only	45	116
Human and Pet Food	30	48

16. Find the category of food most favored by cats. Write the data from this category as a fraction, as a decimal, and as a percent of the total cat owners surveyed.

編碼：6(h)-2-4-17

(如編碼：6(h)-2-4-15 之題幹)

假設僅對 100 名狗主人進行了調查，結果相似。估計三種食物類別中每種食物的數量。假設僅對 100 名狗主人進行了調查，結果相似。估計三種食物類別中每種食物的數量。社會情境

For Exercises 15–18, use the following information: In a recent survey, 150 dog owners and 200 cat owners were asked what type of food their pets liked. Here are the results of the survey.

Preference	Dogs	Cats
Human Food Only	75	36
Pet Food Only	45	116
Human and Pet Food	30	48

17. Suppose only 100 dog owners were surveyed with similar results. Estimate the counts in each of the three food categories.

編碼：6(h)-2-4-18

(如編碼：6(h)-2-4-15 之題幹)

假設對 50 位貓主人進行了調查，結果相似。估計三個食品類別中每一個類別的計數。社會情境

For Exercises 15–18, use the following information: In a recent survey, 150 dog owners and 200 cat owners were asked what type of food their pets liked. Here are the results of the survey.

Preference	Dogs	Cats
Human Food Only	75	36
Pet Food Only	45	116
Human and Pet Food	30	48

18. Suppose 50 cat owners were surveyed with similar results. Estimate the counts in each of the three food categories.

編碼：6(h)-2-4-19

Elisa 的數學考試成績（包括額外學分）是 $\frac{26}{25}$ 。百分比是什麼嗎？**個人情境**

19. Elisa's math test score, with extra credit included, was $\frac{26}{25}$. What percent is this?

編碼：6(h)-2-4-20

使用下面的數據。埃姆赫斯特和小頸哪個社區更支持建造新的體育中心？

解釋你的推理。社會情境

20. Use the data below. Which neighborhood, Elmhurst or Little Neck, is more in favor of building a new sports complex? Explain your reasoning.

Votes on a New Sports Complex

Neighborhood	Yes	No
Elmhurst	43	57
Little Neck	41	9

編碼：6(h)-2-4-21

在問題 4.1 中，你找到了 Angela、Emily 和 Christina 的罰球命中率。將每個女孩的罰球成功率寫為罰球命中率與罰球命中率的比率。

安琪拉罰球 15 罰 12 中

艾米麗 20 次罰球中 15 次

克里斯蒂娜 16 次罰球中 13 次 個人情境

21. In Problem 4.1, you found free-throw percentages for Angela, Emily, and Christina. Write each girl's free-throw success as a ratio of *percent made* : *percent missed*.

Angela made 12 out of 15 free throws

Emily made 15 out of 20 free throws

Christina made 13 out of 16 free throws

編碼：6(h)-2-4-22

一家糖果製造商在網站上表示，希望新產品的消費者口味偏好達到 60:40。
你認為這是什麼意思？**職業情境**

22. A candy manufacturer says on its Web site that it wants to reach a 60 : 40 consumer taste preference for new products. What do you think this means?

編碼：6(h)-2-4-23

在某些汽車中，後座可以向下折疊以增加後行李箱的空間。通常，後排座椅的分割比例為 60:40，而不是 50:50。如果後排座椅寬 60 英寸，分割比例為 60:40，那麼這兩個部分的寬度是多少？ 個人情境

- 23.** In some cars, the rear seat folds down to add more space in the trunk. Often, there is a 60 : 40 split in the rear seat instead of 50 : 50. If a rear seat is 60 inches wide with a 60 : 40 split, how wide are the two parts?



編碼：6(h)-2-4-24

90：10 規則說，你人生的成功部分來自於你所發生的事情，部分來自於你對它的反應。哪個是 90，哪個是 10？解釋。個人情境

24. The 90 : 10 rule says that part of your success in life comes from what happens to you and part comes from how you react to it. Which is 90 and which is 10? Explain.

編碼：6(h)-2-4-25

複製表格並填寫缺少的部分。無情境

25. Copy the table and fill in the missing parts.

Percent	Decimal	Fraction
62%	■	■
■	■	$\frac{4}{9}$
■	1.23	■
■	■	$\frac{12}{15}$
■	2.65	■
■	0.55	■
48%	■	■
■	■	$\frac{12}{10}$

編碼：6(h)-2-4-26

使用基準或其他對您有意義的策略來比較練習 26-31 中的每一對分數。複製分數並插入 <、> 或 = 以做出正確的陳述。無情境

Compare each pair of fractions in Exercises 26-31 using benchmarks or another strategy that makes sense to you. Copy the fractions and insert <, >, or = to make a true statement.

26. $\frac{7}{10} \square \frac{5}{8}$

編碼：6(h)-2-4-27

(如編碼：6(h)-2-4-26 之題幹) 無情境

Compare each pair of fractions in Exercises 26–31 using benchmarks or another strategy that makes sense to you. Copy the fractions and insert $<$, $>$, or $=$ to make a true statement.

27. $\frac{11}{12}$ \square $\frac{12}{13}$

編碼：6(h)-2-4-28

(如編碼：6(h)-2-4-26 之題幹) 無情境

Compare each pair of fractions in Exercises 26–31 using benchmarks or another strategy that makes sense to you. Copy the fractions and insert $<$, $>$, or $=$ to make a true statement.

28. $\frac{12}{15} \square \frac{12}{14}$

編碼：6(h)-2-4-29

(如編碼：6(h)-2-4-26 之題幹) 無情境

Compare each pair of fractions in Exercises 26–31 using benchmarks or another strategy that makes sense to you. Copy the fractions and insert $<$, $>$, or $=$ to make a true statement.

29. $\frac{3}{8}$ \square $\frac{4}{8}$

編碼：6(h)-2-4-30

(如編碼：6(h)-2-4-26 之題幹) 無情境

Compare each pair of fractions in Exercises 26–31 using benchmarks or another strategy that makes sense to you. Copy the fractions and insert $<$, $>$, or $=$ to make a true statement.

30. $\frac{3}{5}$ \square $\frac{4}{6}$

編碼：6(h)-2-4-31

(如編碼：6(h)-2-4-26 之題幹) 無情境

Compare each pair of fractions in Exercises 26–31 using benchmarks or another strategy that makes sense to you. Copy the fractions and insert $<$, $>$, or $=$ to make a true statement.

31. $\frac{4}{3}$ \square $\frac{15}{12}$

編碼：6(h)-2-4-32

複製下表並填寫缺少的部分。無情境

32. Copy the table below and fill in the missing parts.

Fraction	Mixed Number
$\frac{13}{5}$	■
■	$5\frac{2}{7}$
■	$9\frac{3}{4}$
$\frac{23}{3}$	■

編碼：6(h)-2-4-33

以下百分比是一組很好的基準，因為它們有普通分數和小數等值。複製表格並填寫缺失的部分。使用您的表格來了解這些等效內容。無情境

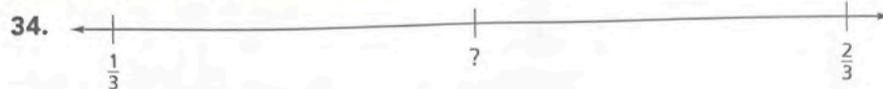
33. The following percents are a good set of benchmarks because they have common fraction and decimal equivalents. Copy the table and fill in the missing parts. Use your table to learn these equivalents.

Percent	10%	$12\frac{1}{2}\%$	20%	25%	30%	$33\frac{1}{3}\%$	50%	$66\frac{2}{3}\%$	75%
Fraction	■	■	■	■	■	■	■	■	■
Decimal	■	■	■	■	■	■	■	■	■

編碼：6(h)-2-4-34

在練習 34-36 中，確定數軸上兩個標記值中間標記的正確分數是哪一個分數。將分數寫為百分比和小數。無情境

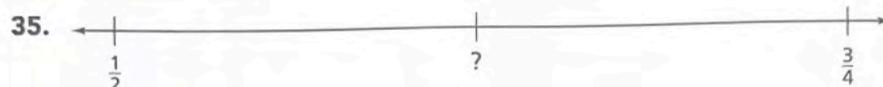
In Exercises 34–36, determine what fraction is the correct label for the mark halfway between the two marked values on the number line. Write the fraction as a percent and as a decimal.



編碼：6(h)-2-4-35

(如編碼：6(h)-2-4-34 之題幹) 無情境

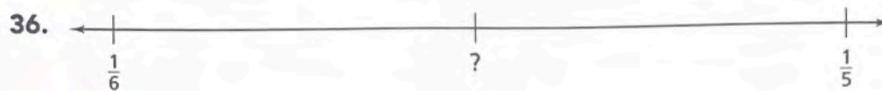
In Exercises 34–36, determine what fraction is the correct label for the mark halfway between the two marked values on the number line. Write the fraction as a percent and as a decimal.



編碼：6(h)-2-4-36

(如編碼：6(h)-2-4-34 之題幹) 無情境

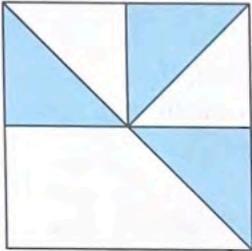
In Exercises 34–36, determine what fraction is the correct label for the mark halfway between the two marked values on the number line. Write the fraction as a percent and as a decimal.



編碼：6(h)-2-4-37

下面的正方形中陰影部分佔幾分之幾？解釋。無情境

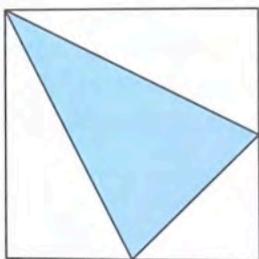
37. What fraction of the square below is shaded? Explain.



編碼：6(h)-2-4-38

(翻譯問題) 以十進位制形式，下面的正方形的哪一部分是陰影的？解釋之。無情境

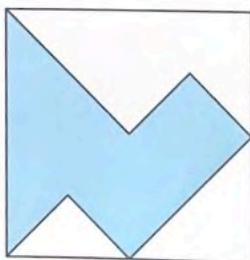
38. In decimal form, what part of the square below is shaded? Explain.



編碼：6(h)-2-4-39

下面的正方形的陰影百分比是多少？解釋之。無情境

39. What percent of the square below is shaded? Explain.



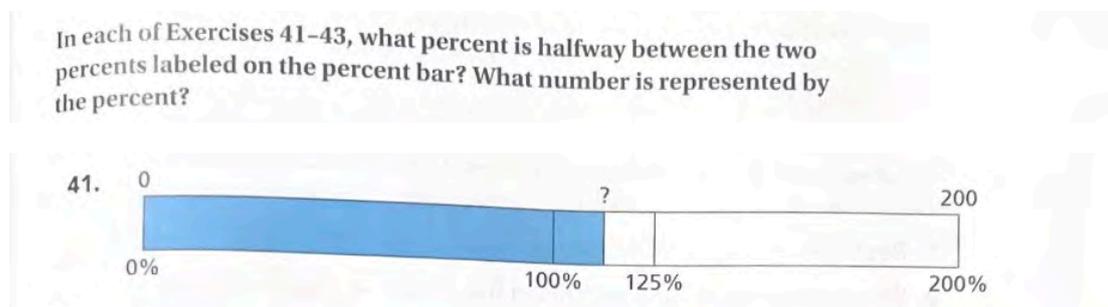
編碼：6(h)-2-4-40

一家寵物店出售貓咪用易消化漱口水。為推廣新產品，商店現價比正常價格 2.00 美元，8 盎司瓶裝優惠 0.50 美元。漱口水的折扣百分比是多少？**職業情境**

40. A pet store sells digestible mouthwash for cats. To promote the new product, the store is offering \$.50 off the regular price of \$2.00 for an 8-ounce bottle. What is the percent discount on the mouthwash?

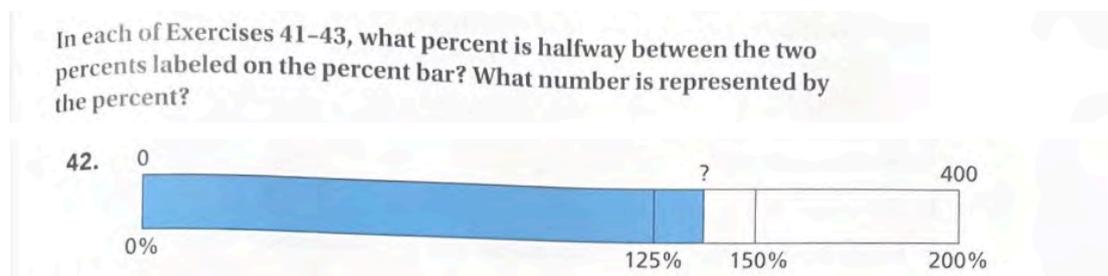
編碼：6(h)-2-4-41

練習 41-43 中，百分比條中兩者之間標記的百分比是多少？無情境



編碼：6(h)-2-4-42

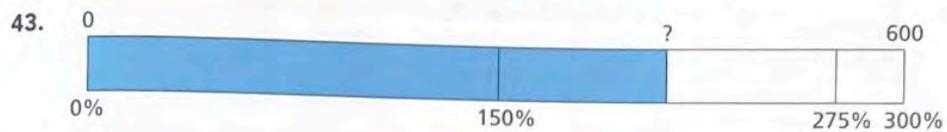
(如編碼：6(h)-2-4-41 之題幹) 無情境



編碼：6(h)-2-4-43

(如編碼：6(h)-2-4-41 之題幹) 無情境

In each of Exercises 41–43, what percent is halfway between the two percents labeled on the percent bar? What number is represented by the percent?



編碼：6(h)-2-4-44(A, B)

一家商店提供所有參考書 30% 的折扣。

(A) 如果折扣前一本字典的售價為 12 美元，那麼折扣後的金額是多少？

C。如果你花 14 美元買一本數學字典，原價是多少字典的？個人情境

(B) 如果一本關於昆蟲辨識的書原價 15 美元，你需要付多少錢嗎？個人情境

(C) 如果你花 14 美元買一本數學字典，原價是多少字典的？個人情境

44. A store offers a discount of 30% on all reference books.

- a. If a dictionary costs \$12 before the discount, what is the dollar amount of the discount?
- b. If a book on insect identification originally costs \$15, how much will you have to pay for it?
- c. If you pay \$14 for a math dictionary, what was the original price of the dictionary?

編碼：6(h)-5-4-1

找到日常生活中使用的百分比的三個例子。報紙、雜誌、廣播、網際網路和電視都是看的好地方。寫下每個示例，或將其剪下並貼上到您的紙上。對於每個示例，描述百分比的使用方式及其含義。個人情境

1. Find three examples of percents used in everyday life. Newspapers, magazines, radio, the Internet, and television are good places to look. Write down each example, or cut it out and tape it to your paper. For each example, describe how percents are used and what they mean.

編碼：6(h)-5-4-2

狂歡節的熱狗每隻 2.99 美元，外加 7% 的稅。一個熱狗的總成本是多少？

個人情境

2. Hot dogs at a carnival cost \$2.99 each plus 7% tax. What is the total cost for one hot dog?

編碼：6(h)-5-4-3(A, B, C)

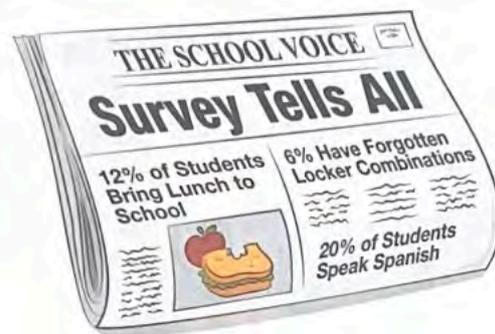
A 班對 1000 名學生進行了調查

(A) 調查顯示，20%的學生會說西班牙語。有多少學生會說西班牙語？**社會情境**

(B) 在某個時候，6%的學生忘記了他們的儲物櫃組合。有多少學生忘記了他們的儲物櫃組合？**社會情境**

(C) 在接受調查的六年級學生中，12%的人把午餐帶到學校。假設 24 名六年級學生這樣做。學校有多少六年級學生？**社會情境**

3. A class conducts a survey of 1,000 students.



- a. The survey reveals that 20% of the students speak Spanish. How many students speak Spanish?
- b. At one time or another, 6% of the students have forgotten their locker combinations. How many students have forgotten their locker combinations?
- c. Of the Grade 6 students surveyed, 12% bring their lunch to school. Suppose 24 sixth graders do this. How many Grade 6 students are at the school?

編碼：6(h)-5-4-4(A, B, C)

Arif and Keisha 去一家餐廳吃晚飯。他們的膳食總額為 13.75 美元。稅是 5%。

(A) 賬單上加了多少稅？個人情境

(B) Arif 和 Keisha 希望根據賬單和稅收的合併留下 15% 的小費。他們應該留下多少錢？解釋之。個人情境

(C) Arif 點了一頓比 Keisha 更貴的飯菜。在計算完稅款和小費後，他決定應該比 Keisha 多支付 3 美元。每人應該付多少錢？個人情境

4. Arif and Keisha go to a restaurant for dinner. Their meals total \$13.75. The tax is 5%.
- How much tax is added to the bill?
 - Arif and Keisha want to leave a 15% tip based on the bill and the tax combined. How much should they leave? Explain.
 - Arif ordered a more expensive meal than Keisha. After the tax and tip were figured, he decided he should pay \$3.00 more than Keisha. How much should each pay?

編碼：6(h)-5-5-5(A, B, C)

(A) Jen 和 Sarah 去 Green Grill 吃午餐。他們的餐費總計 28.00 美元。稅率為 6%。個人情境

(A) 包括稅金在內的總成本是多少？

(B) Jen 和 Sarah 想留下 20% 的小費（不含稅前費用）。他們該留下多少小費？個人情境

(C) 描述珍和莎拉可以用來計算小費金額的兩種策略。個人情境

5. Jen and Sarah go to lunch at the Green Grill. Their meals total \$28.00. The tax is 6%.
- What is the total cost including tax?
 - Jen and Sarah want to leave a 20% tip based on the cost before tax. How much tip should they leave?
 - Describe two strategies that Jen and Sarah can use to figure the amount of the tip.

編碼：6(h)-5-5-6(A, B, C)

瑪麗蓮隨身攜帶一張小費計算器卡。它列出了 100.00 美元以內的整美元價值的 15% 和 20% 小費的金額。她的女兒注意到了一個規律。她說，「成本每增加 1 美元，15% 欄的小費就會增加 0.15 美元。」

(A) 解釋為什麼 15% 小費值會出現這種模式。個人情境

(B) 每增加一美元，20% 欄的增加量是多少？個人情境

(C) 小費計算器卡最多只能支付 100 美元。如果您的餐廳帳單總計 325.00 美元，您如何使用該卡？個人情境

6. Marilyn carries a tip-calculator card with her. It lists the amounts for 15% and 20% tips on whole-dollar values up to \$100.00. Her daughter notices a pattern. She says, "For each dollar the cost increases, the tips in the 15% column increase by \$.15."
- Explain why this pattern occurs for 15% -tip values.
 - For each dollar increase, what is the amount of increase in the 20% column?
 - The tip-calculator card only goes up to \$100.00. How can you use the card if your restaurant bill totals \$325.00?

編碼：6(h)-5-5-7

傑森在嘉年華的拋球遊戲中停下來。標誌上寫著：「三個球 40 美分，六個球 60 美分。」購買一套六個球而不是兩套三個球，他節省了多少百分比？**個人情境**

7. Jason stops at a ball-toss game at the carnival. The sign reads, "Three balls for 40¢ or six balls for 60¢." What percent does he save by buying one set of six balls instead of two sets of three balls?

編碼：6(h)-5-5-8(A, B, C)

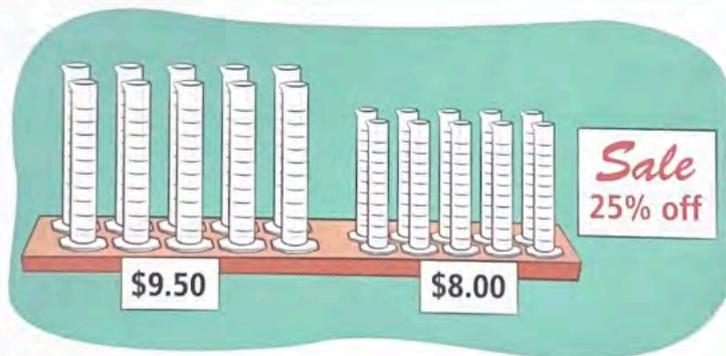
科學用品商店正在促銷。所有量筒有 25% 折扣。Delmar 女士購買了四個量筒，每個量筒的原價為 8.00 美元，另外還購買了六個量筒，每個量筒的原價為 9.50 美元。

(A) Delmar 女士會省多少錢？個人情境

(B) Delmar 女士將支付原價的百分之多少？個人情境

(C) 假設銷售稅是 4%。Delmar 女士的總費用是多少？個人情境

8. The Science Supply Store is having a sale. All graduated cylinders are 25% off. Mrs. Delmar buys four graduated cylinders that were originally \$8.00 each and six that were originally \$9.50 each.



- How much money will Mrs. Delmar save?
- What percent of the original price will Mrs. Delmar pay?
- Suppose the sales tax is 4%. What is Mrs. Delmar's total cost?

編碼：6(h)-5-5-9

練習 9-11 中的問題涉及帽子銷售的商店的折扣。所有常規價格的帽子都打八折。雪莉、麗莎和桑迪各找一頂帽子買。

Shirley 的沙灘帽最初是 24.95 美元。銷售價格是多少？解釋。個人情境

The questions in Exercises 9-11 involve discounts at a store that is having a hat sale. All regular-priced hats are 20% off. Shirley, Lisa, and Sandy each find a hat to buy.

9. Shirley's beach hat was originally \$24.95. What is the sale price?

編碼：6(h)-5-5-10

(如編碼：6(h)-5-5-9 之題幹)

桑迪找到了一個原本價為 12.50 美元的遮陽板。銷售價格是多少？**個人情境**

10. Sandy finds a sun visor that was originally \$12.50. What is the sale price?

編碼：6(h)-5-5-11

(如編碼：6(h)-5-5-9 之題幹)

Lisa 發現了一頂已經標記下來的帽子。價格標籤顯示原價為 36.00 美元。標價為 27.00 美元。帽子被標記了百分之多少？個人情境

11. Lisa finds a hat that is already marked down. The price tag shows that the original price was \$36.00. The marked-down price is \$27.00. What percent has the hat been marked down? Explain.

編碼：6(h)-5-5-12(A, B, C)

直排溜冰鞋以正常價格的 35% 的價格出售。

(A) 這個折扣是多少？ 個人情境

(B) 一雙內聯溜冰鞋的原價為 124.99 美元。銷售價格是多少？ 個人情境

(C) 銷售價格計入 5% 的稅。直排溜冰鞋的總成本是多少？ 個人情境

12. Inline skates are on sale for 35% off the regular price.

- a. What fraction off is this discount?
- b. The original price of one pair of inline skates is \$124.99. What is the sale price?
- c. A tax of 5% is computed on the sale price. What is the total cost of the inline skates?



編碼：6(h)-5-5-13(A, B, C)

每加侖汽油的價格經常變化。大多數司機都密切關注這些變化。找出每種情況價格的百分比變化。

(A) 從每加侖 4.00 美元增加到每加侖 4.20 美元。個人情境

(B) 從每加侖 3.00 美元增加到每加侖 3.75 美元。個人情境

(C) 從每加侖 3.75 美元減少到每加侖 3.00 美元。個人情境

13. The price per gallon of gasoline changes often. Most drivers pay close attention to those changes. Find the percent change in price for each of these cases.

- a. increase from \$4.00 per gallon to \$4.20 per gallon
- b. increase from \$3.00 per gallon to \$3.75 per gallon
- c. decrease from \$3.75 per gallon to \$3.00 per gallon

編碼：6(h)-5-5-14

Theo 做了 $\frac{3}{10}$ 的家庭作業。 $\frac{3}{10}$ 等於百分之多少？ Theo 還得做多少百分比的家庭作業？ 個人情境

14. Theo does $\frac{3}{10}$ of his homework. What percent is equal to $\frac{3}{10}$? What percent of his homework does Theo still have to do?

編碼：6(h)-5-5-15

(多選) 在一項調查中，75%的 400 名家長表示，他們給孩子吃水果作為零食。有多少接受調查的家長做出了迴應？社會情境

A. 150 B. 200 C. 225 D. 300

15. Multiple Choice In a survey, 75% of 400 parents said they give their children fruit as a snack. How many of the parents surveyed gave that response?

A. 150

B. 200

C. 225

D. 300

編碼：6(h)-5-5-16

如果 $2.4 \div 0.2 = 12$ ， $2.4 \div 0.5$ 大於還是小於 12？解釋。無情境

16. If $2.4 \div 0.2 = 12$, is $2.4 \div 0.5$ greater than or less than 12? Explain.

編碼：6(h)-5-5-17

如果 $0.25 \times 0.8 = 0.2$ ， 0.25×0.7 大於還是小於 0.2 ？解釋。無情境

17. If $0.25 \times 0.8 = 0.2$, is 0.25×0.7 greater than or less than 0.2 ? Explain.

編碼：6(h)-5-5-18(A, B)

某種豆類植物每天生長其高度的 15%。

(A) 將這個百分比表示為小數。科學情境

(B) 10 天後的今天，豆子植物有 27 英寸高。昨天有多高？科學情境

- 18.** A certain bean plant grows 15% of its height each day.
- Express this percent as a decimal.
 - Today, after 10 days, the bean plant is 27 inches tall. How tall was it yesterday?



編碼：6(h)-5-5-19

(多選) Ike's Bikes 需要 25% 的費用作為新山地腳踏車的首付。這個百分比是成本的多少部分？個人情境

19. Multiple Choice Ike's Bikes requires 25% of the cost as a down payment for a new mountain bike. What fraction of the cost is this percent?

F. $\frac{9}{35}$

G. $\frac{5}{21}$

H. $\frac{8}{32}$

J. $\frac{7}{24}$

編碼：6(h)-5-5-20

四個朋友點了一個方形披薩。Marisa 說她不是很餓，只想要 10% 的披薩。Tomarr 非常餓，說他會吃 50% 的披薩。Jon 說他會吃 35%，Kwan 說她會吃 15%。有可能嗎？解釋你的推理。個人情境

20. Four friends order a square pizza. Marisa says she isn't very hungry and only wants 10% of the pizza. Tomarr is very hungry and says he will eat 50% of the pizza. Jon says he will eat 35%, and Kwan says she will eat 15%. Is this possible? Explain your reasoning.

編碼：6(h)-5-5-21

跑步鞋公司宣傳說，他們將頒發相當於比賽參賽總數1%的獎品。他們收到了1600份參賽作品。他們應該頒發多少獎品？職業情境

- 21.** The Running Shoe Company advertised that they would award a number of prizes equal to 1% of the total number of entries in a contest. They received 1,600 entries. How many prizes should they award?

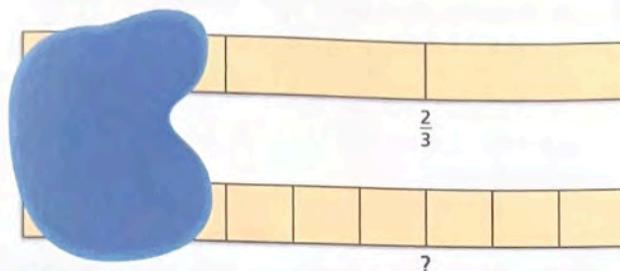
編碼：6(h)-5-5-22

在練習 22 和 23 中，油漆溢出覆蓋了部分分數條。

使用所顯示的內容來推理每組條帶。求出每個問號的分數。個人情境

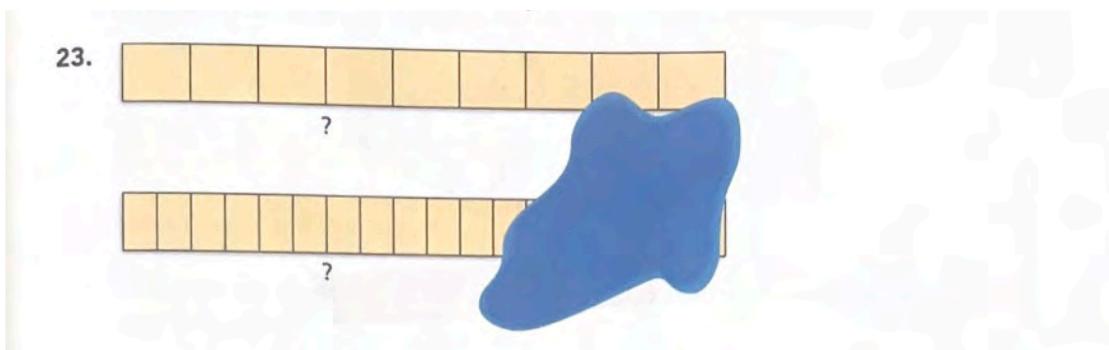
In Exercises 22 and 23, a paint spill covers up part of the fraction strips. Use what is showing to reason about each set of strips. Find a fraction for each question mark.

22.



編碼：6(h)-5-5-23

(如編碼：6(h)-5-5-22 之題幹) 個人情境



編碼：6(h)-5-5-24

對於練習 24-27，找出使每個句子成立的數字。

如果有不只一種解決方案，請至少顯示兩種解決方案。無情境

For Exercises 24–27, find numbers that will make each sentence true.
If there is more than one solution, show at least two solutions.

24. $\frac{4}{9} = \frac{\square}{\square}$

編碼：6(h)-5-5-25

(如編碼：6(h)-5-5-24 之題幹) 無情境

For Exercises 24–27, find numbers that will make each sentence true.
If there is more than one solution, show at least two solutions.

25. $\frac{\square}{\square} = \frac{3}{5}$

編碼：6(h)-5-5-26

(如編碼：6(h)-5-5-24 之題幹) 無情境

For Exercises 24–27, find numbers that will make each sentence true.
If there is more than one solution, show at least two solutions.

26. $\frac{\square}{3} = \frac{8}{\square}$

編碼：6(h)-5-5-27

(如編碼：6(h)-5-5-24 之題幹) 無情境

For Exercises 24–27, find numbers that will make each sentence true.
If there is more than one solution, show at least two solutions.

27. $\frac{5}{\square} = \frac{\square}{18}$

編碼：6(h)-5-5-28

如果您在伊利諾伊州芝加哥購物，州銷售稅為 $9\frac{1}{4}\%$ 。當您購買一張5美元的城市地圖時，您的總成本是多少？**個人情境**

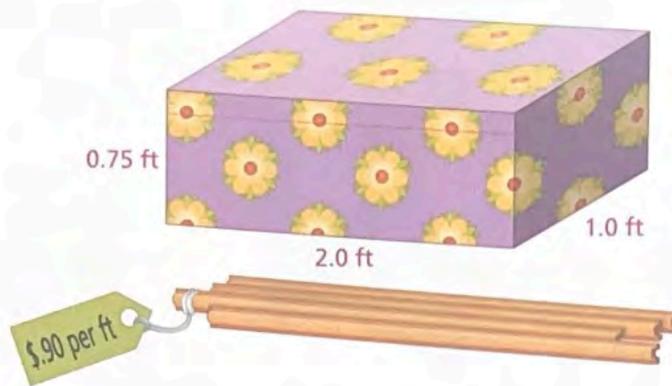
28. If you shop in Chicago, Illinois, the state sales tax is $9\frac{1}{4}\%$. What is your total cost when you purchase a \$5.00 map of the city?

編碼：6(h)-5-5-29(A, B, C, D)

Lynette 擁有一個漂亮的盒子，尺寸如下圖所示。她想保護這個盒子。她被建議沿著每個邊緣放一條造型帶。

- (A) Lynette 決定她需要 0.75 英尺的長度各四個。她正確嗎？個人情境
- (B) Lynette 到底需要多少成型？個人情境
- (C) 成型成本為每英尺 0.90 美元。她的賬單不含稅多少錢？個人情境
- (D) 假設銷售稅是 4%。她的最終賬單是多少？個人情境

29. Lynette owns a beautiful box with dimensions as shown on the diagram below. She wants to protect the box. She has been advised to put a strip of molding along each edge.



- a. Lynette decides she needs four of each of the 0.75-foot lengths. Is she correct?
- b. How much molding does Lynette need in all?
- c. Molding costs \$.90 a foot. How much is her bill without tax?
- d. Suppose the sales tax is 4%. How much will her final bill be?

編碼：6(h)-5-5-30(A, B)

Carrie 從下面的堆疊中買了一條牛仔褲。地方銷售稅為 $2\frac{1}{2}\%$ ，州銷售稅為 5%。

(A) 每筆稅的金額是多少？個人情境

(B) 牛仔褲的總成本是多少？個人情境

30. Carrie buys a pair of jeans from the stack below. The local sales tax is $2\frac{1}{2}\%$ and the state sales tax is 5%.

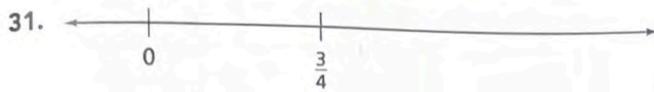


- a. What is the amount of each tax?
- b. What is the total cost of the jeans?

編碼：6(h)-5-5-31

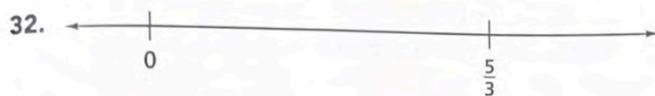
對於練習 31 和 32，複製給定的數字行（包括所有標記的標記）。在 1 處標記每個數字行。將每個分數，包括 1，寫成小數和百分比。無情境

For Exercises 31 and 32, copy the given number line (including all the labeled marks). Mark each number line at 1. Write each fraction, including 1, as a decimal and as a percent.



編碼：6(h)-5-5-32

(如編碼：6(h)-5-5-31 之題幹) 無情境



編碼：6(h)-5-5-33

對於練習 33-36，找到將使每個句子為真的數字。無情境

For Exercises 33–36, find numbers that will make each sentence true.

33. $\frac{1}{3} = \frac{\square}{9} = \frac{\square}{6}$

編碼：6(h)-5-5-34

(如編碼：6(h)-5-5-33 之題幹) 無情境

34. $\frac{\blacksquare}{18} = \frac{8}{12} = \frac{4}{\blacksquare}$

編碼：6(h)-5-5-35

(如編碼：6(h)-5-5-33 之題幹) 無情境

35. $\frac{3}{\square} = \frac{12}{\square} = \frac{9}{\square}$

編碼：6(h)-5-5-36

(如編碼：6(h)-5-5-33 之題幹) 無情境

36. $\frac{\square}{3} = \frac{\square}{21} = \frac{\square}{6}$

編碼：6(h)-5-5-37

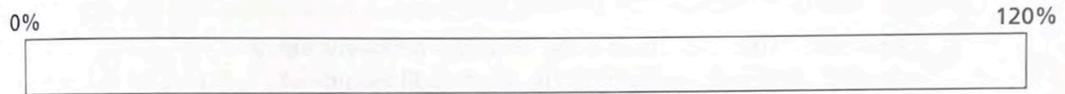
在上面的練習 33-36 中，哪些句子有不止一個可能的答案？解釋。無情境

37. In Exercises 33–36 above, which sentences have more than one possible answer? Explain.

編碼：6(h)-5-5-38

複製下面的百分比條。仔細標記它，以顯示 100% 的位置。無情境

38. Copy the percent bar below. Mark it carefully to show the location of 100%.



編碼：6(h)-5-5-39

寫一個涉及食品、汽車、書籍、衣服或其他物品折扣的百分比問題。然後解決你的問題。個人情境

39. Write a percent problem that involves discounts on food, cars, books, clothes, or other items. Then solve your problem.

編碼：6(h)-5-5-40(A, B)

曼內爾百貨公司每年都會舉行夏季大拍賣。在銷售時，他們為客戶提供所有標明商品的額外 25% 的折扣。

(A) 一條沙灘毛巾的原價為 22.00 美元。它下跌了 10%。額外 25% 的折扣後的最終價格是多少？ 社會情境

(B) 一張露臺桌子和四把椅子最初價格為 350 美元。他們價格下降了 50%。額外折扣後的桌子和椅子的最終價格是多少？ 社會情境

40. Each year the Mannel Department Store has a big end-of-summer sale. At the sale, they give customers an additional 25% off on all marked-down merchandise.
- A beach towel had an original price of \$22.00. It was marked down 10%. What is the final price after the additional 25% discount?
 - A patio table and four chairs originally cost \$350.00. They were marked down 50%. What is the final cost of the table and chairs with the additional discount?

編碼：6(h)-5-5-41

一盒通心粉和乳酪說它比普通盒子多 25%。如果一個普通的盒子可以製作三杯通心粉和乳酪，那麼這個盒子可以製作多少杯？個人情境

- 41.** A box of macaroni and cheese says that it makes 25% more than the regular box. If a regular box makes three cups of macaroni and cheese, how many cups will this box make?

編碼：6(h)-5-5-42(A, B)

消費者價格指數 (CPI) 給出了一個試圖在特定時間衡量某些基本專案平均成本的數字。該指數每年增加的百分比被稱為通貨膨脹率。

(A) 假設 CPI 在整整一年前的價值為 225.3，而該指數的當前價值為 231.16，上漲了 5.86 點。過去一年的通貨膨脹率是多少？社會情境

(B) 如果該指數在明年以相同的金額上升，從 231.16 點上升 5.86 點，明年的通貨膨脹率是否會與過去相同？社會情境

42. The Consumer Price Index (CPI) gives a number that attempts to measure the average cost of certain basic items at a particular time. The percent that this index increases each year is known as the *rate of inflation*.

- a. Suppose the CPI had a value of 225.3 exactly one year ago, and the current value of this index is 231.16, a rise of 5.86 points. What was the rate of inflation over the past year?
- b. If the value of the index rises in the coming year by the same amount, 5.86 points up from 231.16 points, will the rate of inflation be the same for the coming year as for the past year? Explain.

美國七年級教學例

編碼：7-4-1-1

義大利麵以 7 盒售價 6 元出售跟以 5 元出售 6 盒，哪一個比較划算？**個人**
情境

More for Your Money has pasta on sale at 7 boxes for \$6. FreshFoods sells the same pasta at 6 boxes for \$5. **Which** is the better deal?

An illustration showing two boxes of pasta. On the left, a brown box is tipped over, spilling several pieces of yellow, tubular pasta onto a white surface. On the right, a taller, pinkish-red box stands upright, also containing yellow, tubular pasta. The background is a light purple color.

編碼：7-4-1-2

經銷商購買二手車的價格比向客戶出售的價格高出了 15%。假設後來售價降低了 15%。如何判斷新的賣出價格是否與經銷商買入的價格相同？**職業情境**

A dealer's buying price on a used car is marked up by 15% to the selling price for customers. Suppose that the selling price is later marked down by 15%. **How** can you determine whether the new selling price is the same as the dealer's buying price?



編碼：7-4-1-3

小明的工作是照顧黑猩猩，他混合 20 勺高纖維食物和 20 勺高蛋白食物。
他如何調整它使混合物含有 60% 高纖維和 40% 高蛋白？個人情境

Ming's job is to take care of chimps at the zoo. She has a mix of 20 scoops of high-fiber food and 30 scoops of high-protein food. **How** can she adjust this to make the mix 60% high fiber and 40% high protein?



編碼：7-4-1-4(A1,2,3,4,5)

銷售飲料的公司經常報告有關顧客偏好的調查結果。尼爾森中學中的俱樂部正在研究調查和其他的策略營銷。其中一項調查是關於人們對兩種不同口味可樂的偏好。大家對於報告的結果有不同的看法。

(A1) 以下是有關可樂口味測試結果的四種陳述

在口味測試中，喜歡 bolda cola 的人數多於喜歡 cola-nola 的人數，比例為 17139 比 11426。

2. 在口味測試中，有 5731 人更喜歡 bolda cola。

3. 在口味測試中，60% 的人更喜歡 bolda cola。

4. 在口味測試中，喜歡 bolda cola 的人數與喜歡 cola-nola 的人數的比為 3 比 2。

描述上述每句話你認為的含義。職業情境

(A2) 你認為哪像陳述最適合出現在 bolda cola 的廣告中？為什麼？職業情境

(A3) 四種說法有沒有可能基於同一份數據？解釋之。職業情境

(A4) 你還可以用什麼方式來表達這四種主張？解釋之。職業情境

(A5) 假設你調查了 1000 名可樂飲用者。您會期望會有有多少個 bolda cola 飲用者和多少個 cola-nola 飲用者？解釋之。職業情境

The Marketing Club at Neilson Middle School is studying surveys and other marketing strategies. One of the surveys is about people's preferences for two different kinds of cola. Club members have various opinions about ways to report the results from the cola taste test.

Problem 1.1

Here are four statements about the cola taste-test results.

1. In a taste test, people who preferred Bolda Cola outnumbered those who preferred Cola-Nola by a ratio of 17,139 to 11,426.
2. In a taste test, 5,713 more people preferred Bolda Cola.
3. In a taste test, 60% of the people preferred Bolda Cola.
4. In a taste test, people who preferred Bolda Cola outnumbered those who preferred Cola-Nola by a ratio of 3 to 2.

A

1. Describe what you think each statement above means.
2. Which of the above statements do you think would be best in an advertisement for Bolda Cola? Why?
3. Is it possible that all four statements are based on the same survey data? Explain your reasoning.
4. In what other ways could you express the claims in the four statements? Explain your reasoning.
5. Suppose you surveyed 1,000 cola drinkers. What numbers of Bolda Cola and Cola-Nola drinkers would you expect? Explain your reasoning.

編碼：7-4-1-4(B1,2,3,4,5,6)

尼爾森中學的學生正在計劃一場年終活動，學生有 150 名，其中 100 名學生希望舉行體育賽事，50 名希望是音樂會。確定以下陳述是否準確的報告了尼爾森中學調查的結果。

- (B1) 尼爾森中學， $\frac{1}{3}$ 的學生更喜歡音樂會而不是體育賽事。社會情境
- (B2) 學生喜歡體育賽事與音樂會的比例是 2 比 1 嗎。社會情境
- (B3) 學生喜歡音樂會與體育賽事的比例是 1 比 2。社會情境
- (B4) 喜歡體育賽事的學生比喜歡音樂會的學生多出 50 人。社會情境
- (B5) 喜歡體育賽事的學生是喜歡音樂會的學生的兩倍。社會情境
- (B6) 在尼爾森中學，50% 的學生更喜歡音樂會而不是體育賽事。社會情境

Problem 1.1 continued

- B** Students at Neilson Middle School are planning an end-of-year event. Of the 150 students in the school, 100 would like an athletic event and 50 would like a concert. Decide whether each statement below accurately reports the results of the Neilson Middle School survey.
1. At Neilson Middle School, $\frac{1}{3}$ of the students prefer a concert to an athletic event.
 2. Students prefer an athletic event to a concert by a ratio of 2 to 1.
 3. The **ratio** of students who prefer a concert to students who prefer an athletic event is 1 to 2.
 4. The number of students who prefer an athletic event is 50 more than the number who prefer a concert.
 5. The number of students who prefer an athletic event is two times the number who prefer a concert.
 6. At Neilson Middle School, 50% of the students prefer a concert to an athletic event.

編碼：7-4-1-4(C1,2)

(C1) 研究問題 B（上一題）的每個陳述，提供了哪些信息？遺漏了哪些信息？社會情境

(C2) 使用以上調查結果，如果你考慮較大的學生樣本數，如何預測可能發生的結果？社會情境

- ① 1. Study each correct comparison statement from Question B. What information does each statement give you about the situation? What information is left out?
2. Use the Neilson Middle School survey results above. Suppose you consider a sample of students at a larger school. How might you predict the number of students who prefer an athletic event to a concert?

編碼：7-4-1-5(A1,A2,B1,B2,C1,C2, D)

每年休士頓學校的七年級生都會參加一次戶外露營之旅，每個人都須投入做飯與打掃衛生的工作，阿爾文和瑪利亞負責為營員們製作果汁，他們計劃通過混合水和冷凍濃縮橙汁來製作果汁。為了找出最好味道的混合方式，他們決定測試一些方法。

(A1) 哪一種混合方法能製作最「橙色」的果汁？個人情境

(A2) 哪一種混合方法能製作最不「橙色」的果汁？解釋之。個人情境

(B1) 依莎貝爾與道格使用分數來表達他們的推理，你同意他們其中任何一人的做法嗎？解釋之。個人情境

依莎貝爾： $\frac{5}{9}$ 的混合物 B 是濃縮汁

道格： $\frac{5}{14}$ 的混合物 B 是濃縮汁

(B2) Max 認為混合物 A 和混合物 C 是相同的，「它們都是最橙色的，因位水與濃縮汁都只差 1 杯」他的想法正確嗎？解釋之。個人情境

假設每個營員都會得到 $\frac{1}{2}$ 杯果汁。針對四個混合方式，回答以下問題：

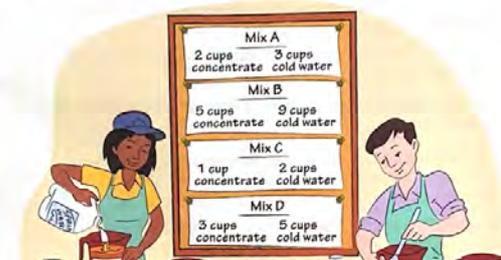
(C1) 為 240 人製作果汁，需要分幾批次？個人情境

(C2) 為 240 人製作果汁，需要多少水與濃縮汁？個人情境

(D) 對於每個配方，製作一杯果汁需要多少水？多少濃縮液？個人情境

Every year, the Grade 7 students at Langston Hughes School go on an outdoor education camping trip. During the week-long trip, the students study nature and participate in recreational activities. Everyone pitches in to help with the cooking and cleanup.

This year, Arvin and Mariah were in charge of making orange juice for the campers. They planned to make the juice by mixing water and frozen orange juice concentrate. To find the mix that would taste best, they decided to test some mixes.



- A**
1. Which mix will make juice that is the most "orangey"? Explain your reasoning.
 2. Which mix will make juice that is the least "orangey"? Explain your reasoning.

- B**
1. Isabelle and Doug used fractions to express their reasoning.

Isabelle:	Doug:
$\frac{5}{9}$ of Mix B is concentrate.	$\frac{5}{14}$ of Mix B is concentrate.

Do you agree with either of them? Explain.

2. Max thinks that Mix A and Mix C are the same. Max says "They are both the most 'orangey' since the difference between the number of cups of water and the number of cups of concentrate is 1." Is Max's thinking correct? Explain.
- C**
1. Assume that each camper will get $\frac{1}{2}$ cup of juice. Answer Questions (1) and (2) below for *each* of the four recipes.
 1. How many batches are needed to make juice for 240 campers?
 2. How much concentrate and how much water are needed to make juice for 240 campers?
- D**
1. For each recipe, how much concentrate is needed to make 1 cup of juice? How much water is needed?

編碼：7-4-1-6

在問題 1.2 中，您可能使用了以下比率來確定哪種配方最「橙」。以下是描述混合 A 的兩個比率。(如下圖)

第一個比率是部分比例。它將整體（果汁）的一部分（水）與另一部分（濃縮物）進行比較。第二個比率是部分對整體比率。它將一部分（濃縮物）與整體（果汁）進行比較。

對於混合 B，您可以將部分對部分的比率寫為 5 杯濃縮比 9 杯水，或 5 : 9 或 $\frac{5}{9}$ 。你可以把部分與整體的比例寫成 5 杯，我濃縮比 14 杯果汁，或 5 : 14，或 $\frac{5}{14}$ 。縮放比率是 Sam 在問題 1.2 中使用的比較策略之一。他寫了… (如下圖)。

Sam 如何使用這些比率來比較混合 A 和混合 B 食譜？

In Problem 1.2, you may have used the ratios below to determine which recipe was the most "orangey." Below are two ratios describing Mix A.

two cups of concentrate
to
three cups of water
2 : 3 or $\frac{2}{3}$

OR

two cups of concentrate
to
five cups of juice
2 : 5 or $\frac{2}{5}$

The first ratio is a **part-to-part ratio**. It compares one part (the water) of the whole (the juice) to the other part (the concentrate). The second ratio is a **part-to-whole ratio**. It compares one part (the concentrate) to the whole (the juice).

For Mix B, you can write the part-to-part ratio as 5 cups concentrate to 9 cups water, or 5 : 9, or $\frac{5}{9}$. You can write the part-to-whole ratio as 5 cups concentrate to 14 cups juice, or 5 : 14, or $\frac{5}{14}$.

Scaling ratios was one of the comparison strategies Sam used in Problem 1.2. He wrote

Part-to-Part Ratio for Mix A

$$\frac{2 \text{ cups concentrate}}{3 \text{ cups water}} = \frac{4 \text{ cups concentrate}}{6 \text{ cups water}} = \frac{6 \text{ cups concentrate}}{9 \text{ cups water}}$$

Part-to-Part Ratio for Mix B

$$\frac{5 \text{ cups concentrate}}{9 \text{ cups water}}$$

- How could Sam use these ratios to compare the Mix A and Mix B recipes?

編碼：7-4-1-7(A,B1,B2)

(A) 一罐典型的濃縮汁可容納 12 液體盎司，標準配方為：將一罐濃縮液與三罐冷水混合。你需要多大的水罐來容納由典型濃縮汁製造的果汁？解釋之。個人情境

一罐典型的濃縮汁可容納 12 液體盎司，標準配方為：將一罐濃縮液與 $4\frac{1}{3}$ 罐冷水混合。

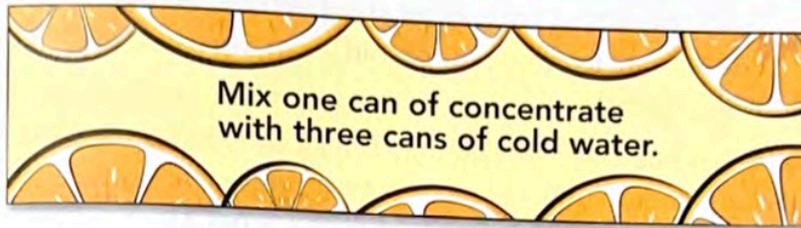
(B1) 你需要多大的水罐來容納由典型濃縮汁製造的果汁？解釋之。個人情境

(B2) 有 $\frac{1}{2}$ 加侖，60 盎司，及 1 加侖的水罐，應該使用哪一種？個人情境

Note: 一加侖 = 128 盎司

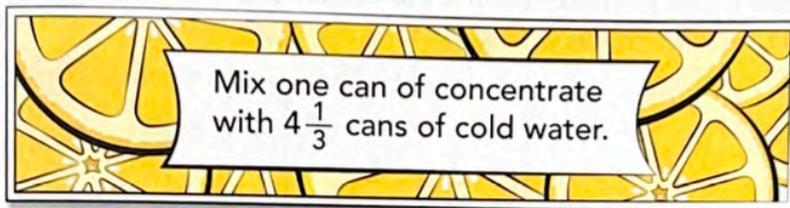
Problem 1.3

- A** A typical can of orange juice concentrate holds 12 fluid ounces. The standard recipe is shown below.



How large a pitcher will you need to hold the juice made from a typical can? Show or explain how you arrived at your answer.

- B** A typical can of lemonade concentrate holds 12 fluid ounces. The standard recipe is shown below.



1. How large a pitcher will you need to hold the lemonade from a typical can? Show or explain how you arrived at your answer.
2. The pitchers below hold $\frac{1}{2}$ gallon, 60 ounces, and 1 gallon. Which container should you use for the lemonade from one can? Explain your reasoning.

Note: 1 gallon = 128 ounces

編碼：7-4-1-7(C1a,C1b,C2,D1,D2)

(C1a) Cece 正在使用一罐 16 盎司的濃縮液製作橙汁。他使用的標準比例是一罐濃縮液與三罐冷水混合，他需要多大的水瓶裝橙汁？**個人情境**

(C1b) 奧莉微亞有一個一加侖的水罐來裝橙汁。他使用的標準比例是一罐濃縮液與 3 罐冷水混合，他需要多少的濃縮液？**個人情境**

(C2) 奧古斯特的冰箱有一些剩下的濃縮檸檬水。他用 $1\frac{1}{2}$ 罐 10 盎司的濃縮

液並使用 1 罐濃縮液混 $4\frac{1}{3}$ 冷水為標準比例，請問他需要多大的水瓶裝？**個**

人情境

(D1) 奧斯喜歡使用等價比例。對於問題 C 的第一部分中的問題，他以分數

形式寫出比例： $\frac{1}{4} = \frac{x}{128}$

每個比率中的數字代表著什麼？x 在這個方程式中代表著什麼？**個人情境**

(D2) 如何求出正確的 x 值？ **個人情境**

C Solve these mixing problems.

- Cece is making orange juice using one 16-ounce can of concentrate. She is using the standard ratio of one can of concentrate to three cans of cold water. How large a pitcher will she need?
 - Olivia has a one-gallon pitcher to fill with orange juice. She uses the standard ratio of one can of concentrate to three cans of cold water. How much concentrate does she need?
- August has some leftover cans of lemonade concentrate in his freezer. He uses $1\frac{1}{2}$ ten-ounce cans of concentrate and the standard ratio of one can of concentrate to $4\frac{1}{3}$ cans of cold water. How large a pitcher does he need?

D Otis likes to use equivalent ratios. For Olivia's problem in Question C, part (1), he wrote ratios in fraction form:

$$\frac{1}{4} = \frac{x}{128}$$

- What do the numbers 1, 4, and 128 mean in each ratio? What does x mean in this equation?
- How can Otis find the correct value of x ?

編碼：7-4-1-8(A,B,C,D)

問題 1.3 中，你使用比率和比例縮放來解決問題。當你將兩個等價的比率以分數形式寫出並將它們設定為相等時，你會形成比例。

Otis 解決橙汁濃縮汁與橙汁比例問題的策略是寫出這樣的比例式：

$$\frac{1}{4} = \frac{x}{128}$$

(A) Otis 寫 $\frac{1}{x} = \frac{4}{128}$ 會有意義嗎？個人情境

(B) Otis 還可以用其他什麼方式來寫比例？個人情境

(C) Otis 通過比例放大解決了 $\frac{1}{4} = \frac{x}{128}$ 的問題。他寫出 $\frac{1 \times 32}{4 \times 32} = \frac{x}{128}$ 。個人情

境

(D) 他怎麼知道要放大 $\frac{32}{32}$ ？個人情境

In Problem 1.3 you used ratios and scaling to solve problems. When you write two equivalent ratios in fraction form and set them equal to each other, you form a **proportion**.

Otis's strategy for solving a problem involving a ratio of orange concentrate to juice was to write this proportion:

$$\frac{1}{4} = \frac{x}{128}$$

- Would it have made sense for Otis to write $\frac{1}{x} = \frac{4}{128}$?
- What are some other ways Otis might have written a proportion?
- Otis solved the proportion $\frac{1}{4} = \frac{x}{128}$ by scaling up. He wrote $\frac{1 \cdot 32}{4 \cdot 32} = \frac{x}{128}$.
- How did he know to scale up by $\frac{32}{32}$?

編碼：7-4-1-9(A, B,C)

在拉伸和收縮中，您使用比率來找到相似數字中缺失的長度。在許多其他情況下，設定比例可以幫助你解決問題。例如，假設美國醫生中，男性人數以 12 比 5 的比例比女性多。

(A) 如果大約 60 萬名美國醫生是男性，你怎麼能知道有多少是女性？**社會情境**

利用你對等值比的瞭解，你可以從這些比例中找到女醫生的數量，找到比例中的缺失值稱為求解比例。

(B) 其中一個比例似乎比其他比例更容易解決嗎？**社會情境**

(C) 那裡有多少名女醫生？**社會情境**

In *Stretching and Shrinking*, you worked with ratios to find missing lengths in similar figures. There are many other situations in which setting up a proportion can help you solve a problem. For example, suppose that among American doctors men outnumber women by a ratio of 12 to 5.

- If about 600,000 American doctors are men, how can you figure out how many are women?

There are four ways to write this as a proportion.

Write the known ratio of men to women doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{12 \text{ men}}{5 \text{ women}} = \frac{600,000 \text{ men}}{x \text{ women}}$$

Write a ratio of men to men data. Complete the proportion with women to women data.

$$\frac{12 \text{ men}}{600,000 \text{ men}} = \frac{5 \text{ women}}{x \text{ women}}$$

Write the known ratio of women to men doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{5 \text{ women}}{12 \text{ men}} = \frac{x \text{ women}}{600,000 \text{ men}}$$

Write a different ratio of men to men data. Complete the proportion with women to women data.

$$\frac{600,000 \text{ men}}{12 \text{ men}} = \frac{x \text{ women}}{5 \text{ women}}$$

Using what you know about equivalent ratios, you can find the number of women doctors from any one of these proportions. Finding the missing value in a proportion is called *solving the proportion*.

- Does one of the proportions seem easier to solve than the others?
- How many women doctors are there?

編碼：7-4-1-10(A,B1,B2,C)

對於每個問題，設置一個比例來顯示已知量與未知量之間的關係。然後使用等值分數、比率、比例來解決問題。

(A) 依瑪尼給狗餵食維生素。對於體重 10 磅的成年犬，建議劑量為每天一茶匙。他需要給體重 80 磅的狗和 7 磅的狗補充維生素，每隻狗的正確劑量為多少？**個人情境**

(B1) 慢跑 5 英里消耗 500 卡路里，塔尼莎需要慢跑多少公里才能消耗他吃掉的 1200 卡路里？**個人情境**

(B2) Tanisha 在兩小時內慢跑 8 公里。他慢跑 12 公里需要多少的時間？**個人情境**

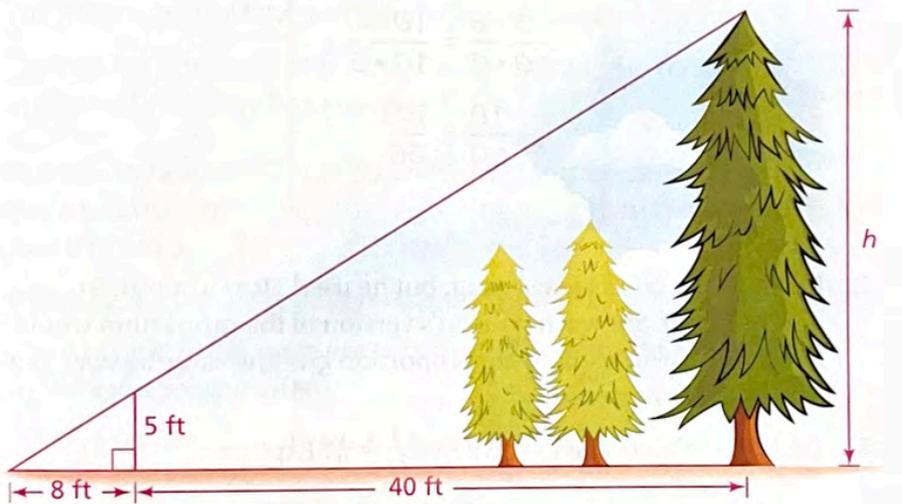
(C) 這張照片中的三角形是相似的。找到樹的高度。**科學情境**

For each question, set up a proportion that shows the relationship between known and unknown quantities. Then use equivalent fractions, ratios, and scaling to solve each proportion.

A Imani gives vitamins to her dogs. The recommended dosage is 1 teaspoon per day for adult dogs weighing 10 pounds. She needs to give vitamins to Bruiser, who weighs 80 pounds and to Dust Ball, who weighs 7 pounds. What is the correct dosage for each dog?

- B**
1. Jogging 5 miles burns about 500 Calories. How many miles does Tanisha need to jog to burn off the 1,200-Calorie lunch she ate?
 2. Tanisha jogs about 8 miles in 2 hours. How long will it take her to jog 12 miles?

The triangles in this picture are similar. Find the height of the tree.



編碼：7-4-1-10(D,E1,E2, E3)

(D) 求解變數 x 的這些比例。使用您所應用的推理問題 A 到 C。(如下圖所示 1-6 小題)無情境

(E1) 尼克用以下方法求解，他該如何皆須完成作答？個人情境

(E2) 凱文認為尼克的想法很棒，但他利用 30 作為分母，請展示凱文是如何呈現解題過程的？凱文放大後的比例是否與尼克給出的答案相同？解釋之。個人情境

(E3) 凱文的方法能幫助你解決 $\frac{7}{12} = \frac{x}{9}$ 的問題嗎？解釋之。個人情境

Problem 1.4 continued

D Solve these proportions for the variable x . Use the reasoning you applied in Questions A through C.

1. $\frac{8}{5} = \frac{32}{x}$

2. $\frac{7}{12} = \frac{x}{9}$

3. $25 : x = 5 : 7$

4. $\frac{x}{3} = \frac{8}{9}$

5. $\frac{x}{5} = \frac{120}{3}$

6. $x : 6 = 10 : 150$

E 1. Nic was working on the proportion below.

$$\frac{3}{10} = \frac{x}{6}$$

He could not see a way to scale 10 to make 6. Instead, he scaled both sides of the proportion. His work is shown below. How could Nic complete his solution?

$$\begin{aligned}\frac{3}{10} &= \frac{x}{6} \\ \frac{3 \cdot 6}{10 \cdot 6} &= \frac{10 \cdot x}{10 \cdot 6} \\ \frac{18}{60} &= \frac{10x}{60}\end{aligned}$$

2. Kevin thinks Nic's idea is great, but he used 30 as a common denominator. Show what Kevin's version of the proportion would look like. Does Kevin's scaled-up proportion give the same answer as Nic's? Explain your reasoning.

3. Does Kevin's work help you solve $\frac{7}{12} = \frac{x}{9}$? Explain.

編碼：7-4-2-1(A,B1,B2,C1,C2,C3,C4)

(A1) 每桌營員平分披薩。坐在小桌的可以跟坐在大桌的分到一樣數量的披薩嗎？解釋之。社會情境

(B1) 賽琳娜想要知道是小桌子人還是大桌子的人分得更多。他使用了兩種比例，8:3 和 10:4，並說：「10 和 4 是差 6。8 和 3 是差 5。大桌子有更多的人，所以小桌子的人得到更多的披薩」你同意他的推理嗎？解釋之。社會情境

(B2) 托尼不同意他的觀點，他說：「如果你在大桌子上放 5 個披薩，在小桌子上放 3 個披薩，賽琳娜的方法會顯示大桌子上的人會與小桌子上的人得到相同數量的披薩。然而，如果 10 人分享 5 個披薩，每人會分得 $\frac{1}{2}$ 個披薩。這會比小桌子 8 人分 3 個披薩得到的多」你同意托尼的推理嗎？解釋之。社會情境

(C1) 有 160 營員，如果每人都坐小桌子，營地需要訂多少個披薩？社會情境

(C2) 如果每人都坐大桌子，營地需要訂多少個披薩？社會情境

(C3) 營長還有一個超大桌子，可以坐 25 人，有多少披薩可以放在著個桌子上？解釋之。社會情境

(C4) 如果每個人都坐在超大桌子，應該點多少披薩？社會情境

A The campers at each table share the pizzas equally. Does a person sitting at a small table get the same amount of pizza as a person sitting at a large table? Explain your reasoning.

B Selena wonders whether a person at a small table or a person at a large table gets more pizza. She uses two ratios, 8 : 3 and 10 : 4, and says

The difference of 10 and 4 is 6. The difference of 8 and 3 is 5. The large table has more people, so the people at the small table will get more pizza.

1. Do you agree with Selena's reasoning? Explain.
2. Tony disagrees with Selena. He says

If you place five pizzas on the large table and three pizzas on the small table, Selena's method would show that the campers at the large table and the campers at the small table get the same amount of pizza.

If ten people share five pizzas, however, each person gets $\frac{1}{2}$ pizza. That's more pizza than each of the eight people who share three pizzas will get.

Do you agree with Tony's reasoning? Explain.

C There are 160 campers.

1. If everyone sits at small tables, how many pizzas should the camp director order?
2. If everyone sits at large tables, how many pizzas should the camp director order?
3. The camp director also has extra-large tables that seat 25. How many pizzas should be placed on each of these tables? Explain.
4. How many pizzas should he order if everyone sits at extra-large tables?

編碼：7-4-2-2

下面的每個陳述中都比較了什麼？**個人情境**

野餐時，我們每人需要兩份三明治。

當我為鄰居照看孩子時，每小時學習 5.50 美元。

自助餐廳的神秘肉每份 6 盎司有 355 卡路里。

Akira 的最高執行率是每小時 8.5 公里。

• What is being compared in each statement below?

We need two sandwiches for each person at the picnic.

I earn \$5.50 per hour when I babysit for my neighbor.

The mystery meat in the cafeteria has 355 Calories per 6-ounce serving.

Akira's top running rate is 8.5 kilometers per hour.

編碼：7-4-2-3

以下的比如何相似？ 他們有什麼不同？ 個人情境

- How are the ratios below similar? How are they different?

2 sandwiches to 1 person

2 votes for Bolda Cola to 1 vote for Cola Nola

編碼：7-4-2-4

馬克杯嘴寬與哈巴狗嘴寬的比例是 2 : 1。這是一個比率嗎？解釋。
個人
情境

- The ratio of the width of Mug's mouth to the width of Pug's mouth is 2 : 1. Is this a rate? Explain.

編碼：7-4-2-5(A1,A2,A3,A4,B1,B2,B3)

(A1) 當營隊計劃餐批薩時，他們需要計算許多不同數量的披薩花費。複製下方的披薩價格表，填寫表格中顯示的每一個披薩數量的價格。社會情境

(A2) Royal 店 53 個披薩要多錢？解釋之。個人情境

(A3) Howdy 店 27 個披薩要多少錢？解釋之。個人情境

(A4) 營員考慮他們的預算，他們可以用 400 美元買多少 Royal 店的披薩？如果只有 96 美元怎麼辦？解釋之。社會情境

(B1) 如果你知道一份披薩的價格，你如何找到剩下額外數量披薩的價錢？個人情境

(B2) 對於每個披薩，依據 part1 寫一個任意數量的披薩 n 的總價格 P 的方程。個人情境

(B3) 你的方程如何幫助你解決問題 A 中的第四小題？個人情境

As the campers plan their pizza dinner, they need to calculate the costs for many different numbers of pizzas.

- A** 1. Copy the pizza price table below. Complete the table with the prices for each of the numbers of pizzas shown.

Pizza Prices

Number of Pizzas	1	2	3	4	5	10	15	20	100	150	200
Price of Royal Pizza	■	■	■	■	■	\$120	■	■	■	■	■
Price of Howdy's Pizza	■	■	■	■	■	■	\$195	■	■	■	■

2. How much will 53 pizzas from Royal cost? Explain your reasoning.
3. How much will 27 pizzas from Howdy's cost? Explain.
4. The campers consider their budget. How many pizzas can they buy from Royal with \$400? What if they only have \$96? Explain.
- B** 1. If you know the price of one pizza, how can you find the price of additional numbers of pizzas?
2. For each pizza place, use your strategy from part (1) to write an equation for the total price P for any number of pizzas n .
3. How does your equation help you solve problems such as those in Question A, part (4)?

編碼：7-4-2-5(C1a, C1b,C1c ,C2a,C2b ,C2c)

(C1a) Howdy 的標價僅在你取餐時有效，如果你要求送貨，他們會對任意數量的披薩收取 5 美金的固定費用。複製並填寫下表。查找如果外送或如果自取，Howdy 的價錢。個人情境

(C1b) 描述在表格中看到的方程。個人情境

(C1c) 在問題 B 的第二部分，你為 Howdy 編寫了一個方程，方程所表示的信息如何出現在表中？解釋之。個人情境

(C2a) 在同一個座標平面上，繪製不含運份和含運費的 Howdy 的價格數據。個人情境

(C2b) 這些圖表有何相似之處？有何不同之處？個人情境

(C2c) 對於每個圖表，哪些座標對表示一個披薩價格是多少？零個披薩多少錢？個人情境

- Ⓒ Howdy's listed price is valid only if you pick up the pizza. If you request delivery, they charge a flat \$5 fee for any number of pizzas.



1. a. Copy and complete the table below. Find the prices for Howdy's pizzas if you pick up and if they deliver.

Howdy's Pizza Prices

Number of Pizzas	1	2	3	4	5	10	15
Price if Howdy's Delivers	■	■	■	■	■	■	■
Price for Pick Up	■	■	■	■	■	■	\$195

- b. Describe the patterns you see in the table.
- c. In Question B, part (2), you wrote an equation for the cost of pizza at Howdy's. How does the information represented by the equation show up in the table? Explain.
2. a. On the same coordinate plane, plot the data for Howdy's prices with no delivery fee and with the delivery fee.
- b. How are the graphs similar? How are they different?
- c. For each graph, which coordinate pair represents how much one pizza costs? how much zero pizzas cost?

編碼：7-4-2-6(A1,A2,A3,A4, A5a,A5b,A5c,A5d,A6a,A6b,A6c)

(A1) Fresh Foods 出售橙子，10 個橙子售價 2 美元。對於以下部分，找到單位費率，請務必使用正確的單位標記答案，每個橙子的價錢為多少？**職業情境**

(A2) 1 美元可以買多少橙子？**個人情境**

(A3) 複製並填寫下表。**個人情境**

(A4) 如何查找單位費率幫助解決以下問題

5 美元可以買多少橙子？

25 個橙子多少錢？**個人情境**

(A5a) 等式 $n=5C$ 將花費 C 與數量 n 聯繫起來。這個等式告訴你價錢與數量間的什麼關係？**個人情境**

(A5b) 關聯這兩中變量的另一種方程是什麼？這個其他方程給你了什麼信息？**個人情境**

(A5c) 從這些方程確定兩個單位比率。解釋一下妳是如何找到單位比率的。單位比率給你提供了什麼信息？**個人情境**

(A5d) 比例常數與單位比率有何關係？**個人情境**

(A6a) 在兩個座標平面上繪製問題 5 的方程，顯示 $n=1$ 到 20。**個人情境**

(A6b) 如何使用圖表查找單位比率？**個人情境**

(A6c) 如何使用圖表查找比例常數？**個人情境**

A FreshFoods has oranges on sale at 10 for \$2. For each part, find the unit rate. Be sure to label your answers with the proper units.

1. What is the cost per orange?
2. How many oranges can you buy for \$1?
3. Copy and complete the table below.

Cost of Oranges at FreshFoods

Number of Oranges, n	10	■	1	20	11	■
Cost, C	\$2	\$1	■	■	■	\$2.60

4. How does finding a unit rate help you answer questions such as the ones below?
 - How many oranges can you buy for \$5?
 - How much do 25 oranges cost?
5. The equation $n = 5C$ relates cost C to number of oranges n .
 - a. What does this equation tell you about the relationship between the number of oranges and the cost of the oranges?
 - b. What is another equation relating these same two variables? What information does this other equation give you?
 - c. Identify two unit rates from these equations. Explain how you found the unit rates. What information do the unit rates give you?
 - d. How does the constant of proportionality relate to the unit rate?
6.
 - a. Graph the equations from Question 5 on two coordinate planes. Show values of n from 1 to 20.
 - b. How can you use the graphs to find the unit rates?
 - c. How can you use the graphs to find the constants of proportionality?

編碼：7-4-2-6(B1,B2,B3,B4,B5a,B5b)

(B1) Noralie 的汽車行駛 600 公里需要加 20 英倫的油。寫出與兩者（行駛公里與所需的油）相關的單位比率，解釋之，每個單位比率是什麼意思？**個人情境**

(B2) 下圖顯示距離 d 與加侖 g 汽油之間的關係，圖表商出現了哪個單位比率？解釋之。**個人情境**

(B3) 依圖表表示出方程。**個人情境**

(B4) 哪個座標對表示一加侖油可行駛的英里數？零加侖汽油呢？**個人情境**

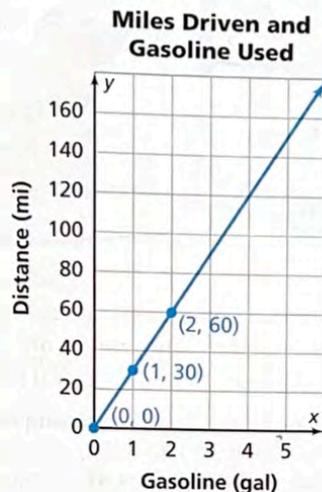
(B5a) Jodh 使用比例 $\frac{600}{200} = \frac{x}{4}$ 求出 4 加侖汽油 Noralie 可行駛的英里數，Lisa

說可以使用單位比率計算。你同意誰的觀點？解釋之。**個人情境**

(B5b) 你還可以用其他策略來計算 4 加侖汽油 Noralie 可行駛的英里數？**個人情境**

B Noralie's car uses 20 gallons of gasoline to go 600 miles.

1. Write two unit rates relating the number of miles Noralie drives and the number of gallons her car uses. Explain your reasoning. What does each unit rate mean?
2. The graph below shows the relationship between distance d and gallons g of gasoline. Which unit rate appears on the graph? Explain.



3. What equation relating d and g does the graph represent?
4. Which coordinate pair represents how far Noralie can drive on 1 gallon of gas? On zero gallons of gas?
5. Josh used the proportion $\frac{600}{20} = \frac{x}{4}$ to find the number of miles Noralie's car can travel on 4 gallons of gasoline. Lisa says she can use a unit rate.
 - a. Do you agree with Josh or with Lisa? Explain.
 - b. What other strategies can you use to find the number of miles Noralie's car can travel on 4 gallons of gasoline?

編碼：7-4-2-6(C1, C2, C3, C4)

格斯想要確定哪一個店鋪的價格更優惠。

(C1) More for your money 義大利麵以 7 盒市價 6 美元出售。格斯製作一個比率表並寫出比例 $7/6=n/1$ 和 $6/7=C/1$ 。什麼資訊是格斯得到用來解決比例問題的？個人情境

(C2) 複製以下費率表。填寫缺失值。個人情境

(C3) FreshFoods 的義大利麵以 6 盒售價 5 美元出售。格斯決定他需要分開， $6 \div 5$ 是描述什麼的值？ $5 \div 6$ 是描述什麼的值？個人情境

(C4) 格斯應該會在哪一家店購買義大利麵？解釋之。個人情境

Ⓒ Gus wants to determine which store has better prices for groceries.



1. At More for Your Money, pasta is on sale at 7 boxes for \$6. Gus makes a rate table and writes the proportions $\frac{7}{6} = \frac{n}{1}$ and $\frac{6}{7} = \frac{C}{1}$. What information does Gus get from solving each proportion?
2. Copy the rate table below. Fill in the missing values.

**Pasta Prices at
More for Your Money**

Cost, C	\$6	\$1	■
Boxes, n	7	■	1

3. At FreshFoods, pasta is on sale at 6 boxes for \$5. Gus decides he needs to divide. What value does the quotient $6 \div 5$ describe? What value does the quotient $5 \div 6$ describe?
4. At which store should Gus buy pasta? Explain.

編碼：7-4-3-1(A,B,C,D1,D2)

(A) 拉塔莎買了一張音樂會門票，他不記得門票的價錢，但他記得他必須繳納 1 美元的稅。塔納莎居住的地方銷售稅為 8%。她畫了一個百分比條找到原價。拉塔莎如何知道票價的 1% 是 0.125 美元？**個人情境**

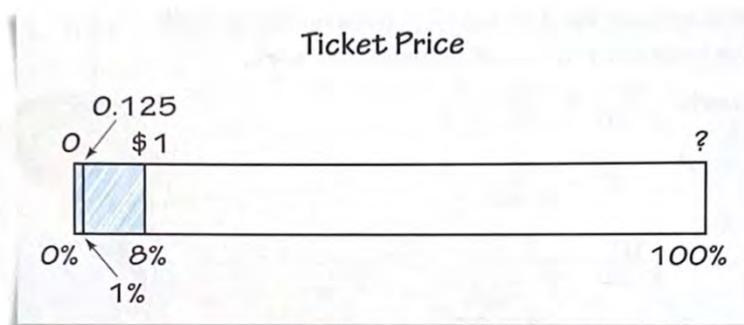
(B) 知道票價的 1% 是 0.125 美元，如何幫助拉塔莎找到票的原價？**個人情境**

(C) 知道票價的 1% 是 0.125 美元，如何幫助拉塔莎找到票的總價？**個人情境**

(D1) 百分比條可以解決涉及百分比問題中的值，也可以使用表格解決同樣的問題。百分比條跟比例表有何相同處？不同處？**個人情境**

(D2) 拉塔莎如何找到缺失值？**個人情境**

Latasha bought a concert ticket. She does not remember the price of the ticket, but she remembers that she had to pay \$1 in tax. Sales tax where Latasha lives is 8%. She drew a percent bar to find the original price.



- How does Latasha know that 1% of the ticket price is \$.125?
- How does knowing that 1% of the ticket price is \$.125 help Latasha find the original price?
- How does knowing that 1% of the ticket price is \$.125 help Latasha find the total price of the ticket?

Percent bars can help you keep track of values in a problem involving percents. You can also use a percent table to organize the information in a percent problem. Latasha used a percent table to solve the same problem.

Percent	8% (tax)	1%	100% (original ticket price)	108% (total price)
Dollars	1	0.125	■	■

- How are percent tables and rate tables similar? How are they different?
- How can Latasha find the missing values in the table?

編碼：7-4-3-2(A1, A2a, A2b, A3a, A3b, A3c, A3d)

胡安在卡拉二手出店銷售汽車。最近他收到了奧托公司的工作邀請。在本題中，你將決定胡安該為卡拉或奧托公司工作。

(A1) 在卡拉二手公司，胡安賺取的佣金為汽車加價的 25%。胡安最近出售以下車輛。對於每輛車，胡安的佣金是多少元？解釋之。職業情境

(A2a) 在卡拉二手車店，汽車加價是購買價格的 10%。對於每輛車，卡拉的購買的價格為多少？解釋之。職業情境

(A2b) 每輛車的售價為多少？解釋之。職業情境

(A3a) 卡拉以 20500 美元購買了一輛小型車，他寫出了一個比例來求售價 S ， $S/110=20500/100$ ，他的方法正確嗎？職業情境

(A3b) 使用上述比例相同的數字，用不同的方式寫出比例。解釋之。職業情境

(A3c) 胡安檢察卡拉的售價，他用 M 來表示加價， $M/10=20500/100$ ，他的方法正確嗎？解釋之。職業情境

(A3d) 一位顧客想要買一輛小型貨車，他的預算是 23000 美元，售價在加 5% 的銷售稅超出了客戶的預算，客戶能承受的最高售價是多少？解釋之。職業情境

Huan sells cars at Carla's Used Cars. Recently he received a job offer from Otto's Used Autos. In this Problem, you will decide whether Huan should work for Carla or for Otto.

A At Carla's Used Cars, Huan earns a commission that is 25% of the markup on the car. Huan recently sold the cars below.



- For each car, what was Huan's commission in dollars? Explain how you found the commissions.
- At Carla's, the markup on a car is 10% of the buying price, the price at which Carla bought the car.
 - For each car, what was Carla's buying price? Explain.
 - For each car, what was the selling price? Explain.
- Carla buys a minivan for \$20,500. She writes a proportion to find the selling price S .

$$\frac{S}{110} = \frac{20,500}{100}$$

Is Carla's method correct? Explain.

- Use the same four numbers as the proportion above. Write the proportion in a different way. Explain how you chose the positions of the numbers in this proportion.
- Huan checks the selling price Carla found. He uses M to represent the markup.
$$\frac{M}{10} = \frac{20,500}{100}$$
Is Huan's method correct? Explain.
 - A customer wants to buy the minivan. Her budget is \$23,000. The selling price plus 5% sales tax goes over the customer's budget. What maximum selling price can the customer afford? Explain.

編碼：7-4-3-2(B1, B2,C1, C2)

在奧托的加價是購買價的 15%，奧托的佣金是加價的 20%。胡安想知道他是否會在卡拉或奧托獲得更多的佣金。

(B1)奧托也花 20500 元購買小貨車，哪一個經銷店在小貨車上會獲得更高的佣金？解釋之。**職業情境**

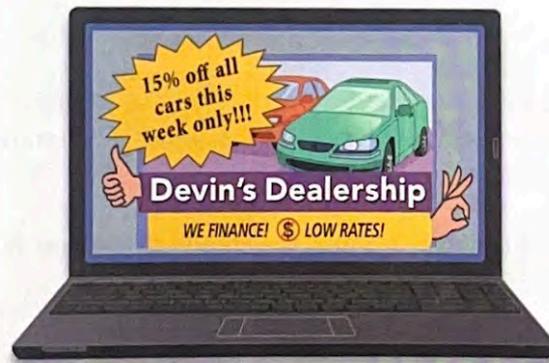
(B2) 在本單元中，你以多種方式比較了數量，寫出兩個陳述，比較胡安在卡拉工作時小貨車獲得的佣金與在奧托工作時小貨車獲得的佣金。**職業情境**

胡安接受了奧托的工作邀約。奧托有一輛豪華車待售，售價為 20700 美元

(C1) 奧托購買這輛豪的價格是多少？解釋之。**職業情境**

(C2) 奧托為他的汽車做折扣。Huan 說，如果 Otto 享受 20,700 美元豪華轎車 15% 的折扣，折扣銷售價格將與購買價格相同。不會有加價，所以 Huan 不會得到佣金。你同意 Huan 的推理嗎？解釋。**職業情境**

- B** At Otto's, the markup is 15% of the buying price. The commission at Otto's is 20% of the markup. Huan wonders whether he will get higher commissions at Carla's or at Otto's.
1. Otto also bought a minivan for \$20,500. At which dealership would Huan make a higher commission on the minivan? Explain.
 2. In this Unit, you have compared quantities in many ways. Write two statements comparing Huan's commission on the minivan if he works for Carla to his commission if he works for Otto.
- C** Huan takes the job at Otto's Used Autos. Otto has a luxury sedan for sale at a selling price of \$20,700.
1. What was Otto's buying price for the luxury sedan? Explain.
 2. Otto offers a discount on his cars.



Huan says that if Otto takes 15% off the \$20,700 luxury sedan, the discounted selling price will be the same as the buying price. There will be no markup, so Huan will not get a commission. Do you agree with Huan's reasoning? Explain.

編碼：7-4-3-3

您可以使用單位率（例如每碼3英尺）來轉換測量值。以下關係可能對這個問題有所幫助。（如下圖）

解決這個比例會告訴你什麼？**個人情境**



You can use unit rates, such as 3 feet per yard, to convert measurements. The following relationships may be helpful in this Problem.

Measurement Conversions

<p style="text-align: center;">Mass</p> <p>1 pound = 16 ounces 1 kilogram = 2.2 pounds</p>	<p style="text-align: center;">Length</p> <p>1 meter = 100 centimeters 1 foot = 12 inches 1 inch = 2.5 centimeters</p>	<p style="text-align: center;">Currency</p> <p>1 dollar = 100 cents 1 quarter = 25 cents</p>
<p style="text-align: center;">Capacity</p> <p>1 gallon = 16 cups 1 cup = 8 fluid ounces</p>	<p style="text-align: center;">Time</p> <p>1 hour = 60 minutes 1 minute = 60 seconds 1 day = 24 hours 1 week = 7 days</p>	

You can also use proportions to convert measurements. For example,

$$\frac{1 \text{ cup}}{8 \text{ fluid ounces}} = \frac{x \text{ cups}}{50 \text{ fluid ounces}}$$

- What would solving this proportion tell you?

編碼：7-4-3-4(A1,A2,A3,A4,A5,A6,A7)

在本單元中，您使用了比率、比例、單位比率、比率表和方程來解決問題。當您解決以下問題時，請嘗試至少使用這些策略一次。

(A1) 凱特在 2 小時內以穩定的速度步行 5 英里。她能走多遠 1 小時 15 分鐘？解釋你的推理。個人情境

(A2) Sean 在 15 分鐘內步行一英里。以同樣的速度，肖恩在 1 小時 20 分鐘內能走多遠？解釋。個人情境

(A3) 一杯全脂牛奶含有八克脂肪，一加侖的牛奶有幾克的脂肪？解釋之。個人情境

(A4) 內森的割草機 $\frac{2}{3}$ 箱汽油能割 3 塊 1 英畝的草地。他可以用一箱汽油割多少塊一英畝的草地？解釋之。個人情境

(A5) 6 盎司的雞肉含有 276 卡路里熱量。一磅雞肉有多少卡路里？個人情境

(A6) Chetan 為他的妹妹製作一條項鍊，12 顆珠子佔 5 英吋的繩子，一英尺的繩子可以容納多少珠子？解釋之。個人情境

(A7) Chetan 想要製作一條 50 顆珠子的項鍊。他知道 12 顆珠子佔 5 英吋的繩子，但商店只賣以釐米為單位的繩子。他應該買多少釐米的繩子？解釋之。個人情境

A In this Unit, you have used ratios, proportions, unit rates, rate tables, and equations to solve problems. Try to use each of these strategies at least once as you solve the following problems.

1. Kate walks 5 miles in 2 hours at a steady pace. How far can she walk in 1 hour and 15 minutes? Explain your reasoning.
2. Sean walks $\frac{3}{4}$ of a mile in 15 minutes. At the same pace, how far can Sean walk in 1 hour and 20 minutes? Explain.
3. One cup of whole milk has 8 grams of fat. How many grams of fat are in a gallon of whole milk? Explain.
4. Nathan's lawnmower uses $\frac{2}{3}$ of a tank of gas to cut three one-acre lawns. How many one-acre lawns can he cut with a full tank of gas? Explain.
5. There are 276 Calories in 6 ounces of chicken. How many Calories are in 1 pound of chicken?
6. Chetan makes a necklace for his sister. Twelve beads take up 5 inches of string. How many beads fit on 1 foot of string? Explain.
7. Chetan wants to make a necklace with 50 beads. He knows that 12 beads take up 5 inches of string, but the store only sells string by the centimeter. How many centimeters should he buy? Explain.

編碼：7-4-3-4(B1,B2,B3,B4)

Sean 在 15 分鐘內走 $\frac{3}{4}$ 英里。他想知道 1 小時 20 分他能走多遠

(B1) Sean 寫出 $\frac{3}{4} \div \frac{1}{4}$ ，並完成除法。這個表達式提供了什麼信息？**個人情境**

(B2) 考慮問題 A 的第六部分。解釋 Chetan 如何使用 Sean 的計算方式找到一英尺的繩子可以容納多少珠子？**個人情境**

(B3) Davina 告訴 Sean 使用比例來計算他在 1 小時 20 分能走多遠，他寫道 $\frac{3}{1} = \frac{3/4}{1/4} = \frac{x}{1\frac{1}{3}}$ 。Davina 的策略與 Sean 有何相似之處？不同之處？**個人情境**

(B4) Sean 的策略與使用比例表有何相似之處？不同之處？**個人情境**

B Sean walks $\frac{3}{4}$ of a mile in 15 minutes. He wants to know how far he can walk in 1 hour and 20 minutes.

1. Sean writes the expression $\frac{3}{4} \div \frac{1}{4}$ and completes the division. What information does this expression give Sean?
2. Consider Question A, part (6). Explain how Chetan can use Sean's method to find how many beads fit on a foot of string.
3. Davina tells Sean to use a proportion to find how far he can walk in 1 hour and 20 minutes. She writes

$$\frac{3}{1} = \frac{\frac{3}{4}}{\frac{1}{4}} = \frac{x}{1\frac{1}{3}}$$

How is Davina's strategy similar to Sean's strategy? How is it different?

4. How is Sean's strategy similar to using a rate table? How is it different?

Sean's Walking Rate

Distance (miles)	$\frac{3}{4}$	■	■
Time (hours)	$\frac{1}{4}$	1	$1\frac{1}{3}$

編碼：7-4-3-5(A1,A2,A3a,A3b,A3c,B1,B2)

小明在動物園工作，他為小黑猩猩混食物。小明從裝有高纖維食品與高蛋白質食品的麻袋裡混合了大批量的小黑猩猩食物，上圖為他的混合信息

(A1) 複製並填寫表格以查找小黑猩猩的混合物的比例。職業情境

(A2) 寫出兩個有關高纖維食品的勺數 F 與高纖維蛋白的勺數 P 的方程。職業情境

(A3a) Ming 在一批次中使用了 48 勺高蛋白食物，請問他使用了多少勺的高纖維食物？解釋之。職業情境

(A3b) Ming 混合了一批小黑猩猩的食物，總共 125 勺。他使用了多少勺的高纖維食物？解釋之。職業情境

(A3c) 對於上面了個部分，描述解決每個問題的另一種方法。職業情境

一些黑猩猩已抵達動物園，Ming 已經混合了 20 勺高纖維食物和 30 勺高蛋白食物。他發現黑猩猩皆已成年，成年的黑猩猩需要含有更多纖維的食物。

(B1) Ming 需要在她已有的食物組合中添加更多高纖維食物。他使用上面食譜圖的信息來調整混合，他應該還要加多少高纖維食物，解釋之。職業情境

(B2) Ming 的原始混合物含有 20 勺高纖維食物。當 Ming 在混合物中添加更多高纖維食物，高纖維食物的量增加了多少百分比？職業情境

Chimp Food Recipes

Adult Chimps	60% high fiber
	40% high protein
Baby Chimps	40% high fiber
	60% high protein

Ming works at the zoo. She mixes food for the baby chimpanzees. Ming mixes up large batches of baby chimp food from sacks of high-fiber food and sacks of high-protein food. She uses the mix information above.

A 1. Copy and complete the table to find unit rates for the baby chimp mix.

Baby Chimp Food Mix			
Scoops of High-Fiber Food	■	■	1
Scoops of High-Protein Food	■	1	■
Total Scoops in Mix	100	■	■

2. Write two equations relating the number of scoops of high-fiber food F and the number of scoops of high-protein food P .
3. a. Ming uses 48 scoops of high-protein food in one batch. How many scoops of high-fiber food does she use? Explain your reasoning.
 b. Ming mixes a batch of baby chimp food with a total of 125 scoops. How many scoops of high-fiber food does she use? Explain.
 c. For parts (a) and (b), describe another way to solve each problem.
- B Some new chimps arrive at the zoo. Ming had already mixed 20 scoops of high-fiber food and 30 scoops of high-protein food. She finds out that the new chimps are adults. Adult chimps need food that has more fiber.
1. Ming needs to add more high-fiber food to the mix she already has. She uses the information on the previous page to adjust the mix. How many more scoops of high-fiber food should she add? Explain.
2. Ming's original mix contained 20 scoops of high-fiber food. By what percentage did the amount of high-fiber food increase when Ming added more high-fiber food to the mix?

編碼：7-4-3-5(C1, C2, D1, D2, D3, D4)

Ming 繪製了圖示是關於成年黑猩猩的高蛋白與高纖維食物量的方程

$$P = \frac{2}{3}F$$

(C1) 怎麼知道圖表與方程相符？**職業情境**

(C2) 解釋 Ming 如何使用該圖來回答問題 B 的第一部分。**職業情境**

(D1) Ming 想要使用單位比例來計算還有多少勺添加到成年組合中的高纖維食物。他寫了一個比例： x 勺高纖維食物/30 勺高蛋白食物 = (60%)/(40%)。

Ming 說(60%)/(40%)等於單位比率 1.5，他說的對嗎？解釋之。**職業情境**

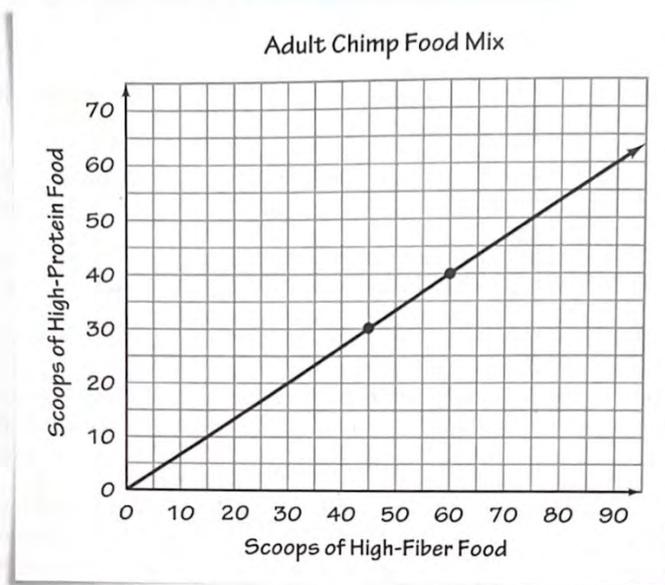
(D2) Ming 將(60%)/(40%)以單位比率 1.5 取代。請解決 $x/30 = 1.5$ 。**職業情境**

(D3) Ming 解決 $x/4.24 = 6.82/2.2$ 的第一步驟是什麼？**職業情境**

(D4) 解決比例 $x/4.24 = 6.82/2.2$ ，說明你的方法。**職業情境**

- C** Ming graphs the equation $P = \frac{2}{3}F$ to show the relationship between the amounts of high-protein food and high-fiber food for adult chimps.

1. How do you know the graph matches this equation?
2. Explain how Ming can use the graph to answer Question B, part (1).



- D** 1. Ming wants to use a unit rate to find how many more scoops of high-fiber food to add to the adult mix. She writes a proportion.

$$\frac{x \text{ scoops of high fiber}}{30 \text{ scoops of high protein}} = \frac{60\%}{40\%}$$

Ming says that $\frac{60\%}{40\%}$ is equal to the unit rate 1.5. Is she correct? Explain.

2. Ming replaces $\frac{60\%}{40\%}$ with the unit rate 1.5. Solve $\frac{x}{30} = 1.5$.
3. What would be Ming's first step in solving $\frac{x}{4.24} = \frac{6.82}{2.2}$?
4. Solve the proportion $\frac{x}{4.24} = \frac{6.82}{2.2}$. Describe the method you used.

美國七年級課後練習

編碼：7(h)-4-1-1(A,B,C)

在兩種果汁飲料的比較口味測試中，780 人更喜歡 Cranberry Blast。只有 220 人喜歡 Melon Splash。完成每一個陳述。

(A) 多多少人更喜歡蔓越莓爆炸？**社會情境**

(B) 在口味測試中，%的人更喜歡蔓越莓味。**社會情境**

(C) 喜歡 Cranberry Blast 的人數多於喜歡 Melon Splash 的人數，比為？**社會情境**

1. In a comparison taste test of two juice drinks, 780 people preferred Cranberry Blast. Only 220 people preferred Melon Splash. Complete each statement.
 - a. There were more people who preferred Cranberry Blast.
 - b. In the taste test, % of the people preferred Cranberry Blast.
 - c. People who preferred Cranberry Blast outnumbered those who preferred Melon Splash by a ratio of to .

編碼：7(h)-4-1-2(A, B, C) 在

穆大學發明的新冰淇淋的口味測試中，750 名新生更喜歡蔓越莓博格冰淇淋，而 1,250 名新生更喜歡椰橙冰淇淋。完成每一個陳述。

- (A) 喜歡蔓越莓沼澤的新生比例是。 社會情境
- (B) 喜歡椰橙的新生的百分比是幾%。 社會情境
- (C) 喜歡椰橙的新生與喜歡蔓越莓的新生的比例為。 社會情境

2. In a taste test of new ice creams invented at Moo University, 750 freshmen preferred Cranberry Bog ice cream, while 1,250 freshmen preferred Coconut Orange ice cream. Complete each statement.
- a. The fraction of freshmen who preferred Cranberry Bog is ■.
 - b. The percent of freshmen who preferred Coconut Orange is ■%.
 - c. The ratio of freshmen preferring Coconut Orange to those who preferred Cranberry Bog was ■ to ■.

編碼：7(h)-4-1-3(A, B, C)

一個城鎮正在討論是否在街道上設置路緣石。支持實施限制措施的城鎮居民與反對實施限制措施的居民之比為 2 比 5。

(A) 有多少居民反對實施限制措施？社會情境

(B) 如果對全鎮 210 人進行調查，您有多少人期望支持實施限制措施？社會情境

(C) 百分之多少的居民反對實施限制措施？社會情境

3. A town is debating whether to put in curbs along the streets. The ratio of town residents who support putting in curbs to those who oppose it is 2 to 5.

a. What fraction of the residents oppose putting in curbs?

b. If 210 people in the town are surveyed, how many do you expect to favor putting in curbs?

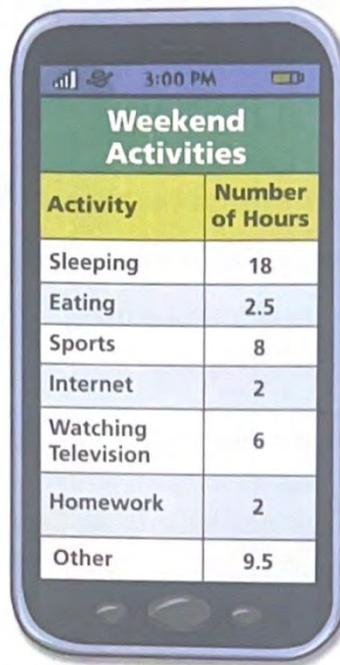
c. What percent of the residents oppose putting in curbs?

編碼：7(h)-4-1-4

一所中學的學生被要求記錄從周五午夜到週日午夜他們如何度過時間。卡洛斯在手機上記錄了他的數據。使用他的手機屏幕進行練習 4-7。

您如何比較卡洛斯週末在各種活動上度過的時間？**個人情境**

Students at a middle school are asked to record how they spend their time from midnight on Friday to midnight on Sunday. Carlos records his data on his phone. Use his phone screen for Exercises 4–7.



Weekend Activities	
Activity	Number of Hours
Sleeping	18
Eating	2.5
Sports	8
Internet	2
Watching Television	6
Homework	2
Other	9.5

4. How would you compare the way Carlos spent his time on various activities over the weekend?

編碼：7(h)-4-1-5(A, B, C, D, E)

(如 7(h)-4-1-4 題幹)

確定每個陳述是否準確描述了卡洛斯如何度過那個週末。解釋你的推理。

- (A) 卡洛斯六分之一的時間都花在看電視上。個人情境
- (B) 看電視的時間與做事的時間之比家務或家庭作業的比例是 3 比 1。個人情境
- (C) 運動、上網和看電視佔據了他大約 33% 的時間。個人情境
- (D) 做作業的時間只佔總時間的 20% 看電視。個人情境
- (E) 睡覺、吃飯和「其他」活動比所有其他活動加起來還要多花 12 個小時。個人情境

5. Decide whether each statement is an accurate description of how Carlos spent his time that weekend. Explain your reasoning.
- a. Carlos spent one-sixth of his time watching television.
 - b. The ratio of hours spent watching television to hours spent doing chores or homework was 3 to 1.
 - c. Sports, Internet, and watching television took about 33% of his time.
 - d. Time spent doing homework was only 20% of the time spent watching television.
 - e. Sleeping, eating, and “other” activities took up 12 hours more than all other activities combined.

編碼：7(h)-4-1-6

(如 7(h)-4-1-4 題幹)

估計週末活動表中的小時數。然後編寫一個比率語句，例如練習 5(b)部分中的比率語句，以適合您的數據。個人情境

6. Estimate the numbers of hours that would be in your weekend activity table. Then write a ratio statement such as the one in Exercise 5, part (b), to fit your data.

編碼：7(h)-4-1-7(A, B, C, D)

(如 7(h)-4-1-4 題幹)

至少使用以下每個概念一次。寫出報表來比較卡洛斯在各種活動上花費的周末時間。

(A) 比例 個人情境

(B) 減法 個人情境

(C) 分數 個人情境

(D) 百分比 個人情境

7. Use each concept below at least once. Write statements to compare the weekend time Carlos spent on his various activities.

a. ratio

b. difference

c. fraction

d. percent

編碼：7(h)-4-1-8(A, B, C, D, E, F)

米德爾伯里中學的一個班級收集了有關以下類型的數據：學生喜歡的電影。使用表格完成每條語句。

- (A) 七年級學生喜歡喜劇與八年級學生喜歡喜劇的比例是。社會情境
- (B) 更喜歡動作片佔學生總數的比例（七年級和八年級學生）是多少？社會情境
- (C) 喜歡動作片的七年級學生的比例是多少？社會情境
- (D) 喜歡喜劇的學生總數的百分比是多少？社會情境
- (E) 年級中喜歡動作片的學生比例較高的是幾年級？社會情境
- (F) 年級中喜歡動作片的學生比例較高的是幾年級？社會情境

8. A class at Middlebury Middle School collected data on the types of movies students prefer. Complete each statement using the table.

Types of Movies Preferred by Middlebury Students

Type of Movie	7th Grade	8th Grade
Action	75	90
Comedy	105	150
Total	180	240

- a. The ratio of seventh-graders who prefer comedies to eighth-graders who prefer comedies is ■ to ■.
- b. The fraction of total students (both seventh- and eighth-graders) who prefer action movies is ■.
- c. The fraction of seventh-graders who prefer action movies is ■.
- d. The percent of total students who prefer comedies is ■.
- e. The percent of eighth-graders who prefer action movies is ■.
- f. Grade ■ has the greater percent of students who prefer action movies.

編碼：7(h)-4-1-9(A, B, C, D)

在一項調查中，100 名學生被問及他們更喜歡看電視還是聽廣播。結果顯示，60 名學生喜歡看電視，40 名學生喜歡聽廣播。每個概念至少使用一次來表達學生的偏好。

- (A) 比率為多少 社會情境
- (B) 減法 社會情境
- (C) 分數 社會情境
- (D) 百分比 社會情境

9. In a survey, 100 students were asked whether they prefer watching television or listening to the radio. The results show that 60 students prefer watching television while 40 prefer listening to the radio. Use each concept at least once to express the student preferences.

- a. ratio
- b. percent
- c. fraction
- d. difference

編碼：7(h)-4-1-10(A, B, C, D)

比較這四種混合物的蘋果汁

(A) 哪種混合物可以製成最「蘋果味」的果汁？解釋你的推理個人情境

(B) 假設您對每種混合物製作一批。每批次的濃縮物比例是多少？個人情境

檢查練習 10 中有關蘋果汁混合物的這些陳述。確定每個陳述是否準確。給出你的答案的理由。個人情境

(C) 將(b)部分的答案重寫為百分比。個人情境

(D) 假設您只製作 1 杯 Mix W。需要多少水和您需要多少濃縮液？個人情境

10. Compare these four mixes for apple juice.

<p>Mix W</p> <p>5 cups concentrate 8 cups cold water</p>	<p>Mix X</p> <p>3 cups concentrate 6 cups cold water</p>
<p>Mix Y</p> <p>6 cups concentrate 9 cups cold water</p>	<p>Mix Z</p> <p>3 cups concentrate 5 cups cold water</p>

- Which mix would make the most “appley” juice? Explain your reasoning.
- Suppose you make a single batch of each mix. What fraction of each batch is concentrate?
- Rewrite your answers to part (b) as percents.
- Suppose you make only 1 cup of Mix W. How much water and how much concentrate do you need?

編碼：7(h)-4-1-11(A, B, C, D)

- (A) MixY 每批次的水分最多，因此嘗起來會最少「蘋果味」。個人情境
- (B) MixZ 是最「蘋果」的，因為濃縮液和水的差異是 2 杯。其他人每個各 3 杯。個人情境
- (C) MixY 是最「蘋果」的，因為它每杯濃縮液只有 1 又 1/2 杯水。其他人每杯水較多。個人情境
- (D) MixX 和 MixY 的味道相同，因為您只需添加 3 杯濃縮液和 3 杯水即可將 MixX 變成 MixY。個人情境

- 11.** Examine these statements about the apple juice mixes in Exercise 10. Decide whether each is accurate. Give reasons for your answers.
- Mix Y has the most water per batch, so it will taste the least “appley.”
 - Mix Z is the most “appley” because the difference between the concentrate and water is 2 cups. It is 3 cups for each of the others.
 - Mix Y is the most “appley” because it has only $1\frac{1}{2}$ cups of water for each cup of concentrate. The others have more water per cup.
 - Mix X and Mix Y taste the same because you just add 3 cups of concentrate and 3 cups of water to turn Mix X into Mix Y.

編碼：7(h)-4-1-12(A, B, C)

如果可能，將濃縮物與水的每次比較寫為比率。如果不可能，請解釋原因。

- (A) 該混合物的濃度為 60%。 個人情境
- (B) 混合物中水的分數是 $\frac{3}{5}$ 。 個人情境
- (C) 濃縮液和水的量相差 4 杯。 個人情境

12. If possible, write each comparison of concentrate to water as a ratio. If not possible, explain why.

- a.** The mix is 60% concentrate.
- b.** The fraction of the mix that is water is $\frac{3}{5}$.
- c.** The difference between the amount of concentrate and water is 4 cups.

編碼：7(h)-4-1-13(A, B, C)

一罐濃縮西柚汁包含說明「將一罐濃縮液與 4 罐冷水混合」。對於練習 13-16，請使用這些混合說明。

寫出每種情況的比率。然後判斷情況是否部分比部分或部分比整體。

(A) 水比濃縮液 個人情境

(B) 濃縮液比果汁 個人情境

(C) 水比果汁 個人情境

A can of concentrated grapefruit juice includes the instructions "Mix one can of concentrate with 4 cans of cold water." For Exercises 13-16, use these mixing instructions.

13. Write a ratio for each situation. Then decide whether the situation is part-to-part or part-to-whole.
- water to concentrate
 - concentrate to juice
 - water to juice

編碼：7(h)-4-1-14(A, B, C, D)

(如 7(h)-4-1-13(A, B, C)之題幹)

確定練習 13 中描述的哪種情況可以用以下比率表示。解釋你的推理

14. Determine which of the situations described in Exercise 13 can be represented by the following ratios. Explain your reasoning.

a. $\frac{12}{60}$

b. $\frac{3}{12}$

c. $\frac{2}{2\frac{1}{2}}$

d. $\frac{5}{10}$

編碼：7(h)-4-1-15

(如 7(h)-4-1-13(A, B, C)之題幹)

Orlando 和 Tanya 正在嘗試不同的混合比例。確定下面的每種混合是否會產生比原始混合說明更濃縮 (更「葡萄柚味」) 或濃度更低 (更少「葡萄柚味」) 的混合物。個人情境

15. Orlando and Tanya are experimenting with different mix ratios. Determine whether each mix below will result in a more concentrated (more "grapefruity") or a less concentrated (less "grapefruity") mix than the original mix instructions.

Mix A

3 cans concentrate : 15 cans water

Mix B

3 cans concentrate : 15 cans juice

Mix C

10 cans cold water : 7 cans concentrate

Mix D

$\frac{1}{4}$ can concentrate : $1\frac{1}{2}$ cans water

編碼：7(h)-4-1-16

(如 7(h)-4-1-13(A, B, C)之題幹)

喬納森和薩曼莎正在為狂歡節濃縮葡萄柚汁。喬納森將 10 罐濃縮液與 40 罐水混合。Samantha 將 8 罐濃縮液與 32 罐水混合。他們的老師要求他們將兩種混合物混合到一個大容器中。確定他們的新混合物是否會減少葡萄柚味、增加葡萄柚味，或者與濃縮罐上的配方相同。解釋你的推理。社會情境

16. Jonathan and Samantha are making grapefruit juice from concentrate for a carnival. Jonathan mixes 10 cans of concentrate with 40 cans of water. Samantha mixes 8 cans of concentrate with 32 cans of water. Their teacher asks them to combine the two mixes into one large container.

Determine whether their new mixture will be less grapefruity, more grapefruity, or the same as the recipe on the can of concentrate. Explain your reasoning.

編碼：7(h)-4-1-17(A, B, C, D)

一罐濃縮西柚汁包含說明「將一罐濃縮液與 4 罐冷水混合」。對於練習 17 和 18，請使用這些混合說明。找出每種情況下的缺失值。說明您使用的比例常數。

(A) 罐濃縮液：幾罐裝水 個人情境

(B) 24 罐濃縮液：幾罐裝果汁 個人情境

(C) 24 罐果汁：幾罐裝水 個人情境

(D) 24 罐果汁：幾罐濃縮 個人情境

A can of concentrated grapefruit juice includes the instructions "Mix one can of concentrate with 4 cans of cold water." For Exercises 17 and 18, use these mixing instructions.

17. Find the missing value in each situation. State the scale factor you used.

a. 24 cans concentrate : ■ cans water

b. 24 cans concentrate : ■ cans juice

c. 24 cans juice : ■ cans water

d. 24 cans juice : ■ cans concentrate

編碼：7(h)-4-1-18

(如編碼：7(h)-4-1-17(A, B, C, D)之題幹)

Raina、Amelia 和 Krista 想求出如果他們使用 128 罐水，他們需要多少罐濃縮液。他們知道他們要解決的問題是。以下哪種策略有效？解釋。個人情境

18. Raina, Amelia, and Krista wanted to find the number of cans of concentrate they would need if they used 128 cans of water. They knew the problem they were trying to solve was $\frac{1}{4} = \frac{x}{128}$. Which of the following strategies would work? Explain.

Raina's Strategy

I was looking for $\frac{1}{4}$ of 128. I took 128 and divided it by 4 to find the value of x.
 $x = 32$

Amelia's Strategy

I wrote a series of equivalent fractions by doubling the numerator and denominator.

$$\frac{1}{4} = \frac{2}{8} = \frac{4}{16} = \frac{8}{32} = \frac{16}{64} = \frac{32}{128} \quad \text{so } x = 32$$

Krista's Strategy

I factored the denominator of the right side of the equation to determine x.

$$\frac{1}{4} = \frac{x}{128} = \frac{1 \cdot 1 \cdot 2}{4 \cdot 4 \cdot 8} \quad \text{so } x = 2$$

編碼：7(h)-4-1-19(A, B)

Jared 和 Pedro 步行 1 英里大約需要 15 分鐘。他們可以保持這個速度幾個小時。

(A) 90 分鐘內他們大約能走多遠？ 個人情境

(B) 他們在 65 分鐘內大約能走多遠？ 個人情境

19. Jared and Pedro walk 1 mile in about 15 minutes. They can keep up this pace for several hours.

a. About how far can they walk in 90 minutes?

b. About how far can they walk in 65 minutes?

編碼：7(h)-4-1-20(A, B)

(如編碼：7(h)-4-1-19(A, B)之題幹)

游泳 $\frac{1}{4}$ 英里消耗的卡路里與跑步一英里消耗的卡路里大致相同。

(A) 吉爾達跑了 26 英里的馬拉松。吉爾達在馬拉松比賽中消耗的卡路里數與她姐姐需要遊多遠才能消耗相同的熱量？**個人情境**

(B) 胡安每天遊 5 英里。他大約需要跑多少英里才能消耗與游泳時相同數量的卡路里？**個人情境**

20. Swimming $\frac{1}{4}$ of a mile uses about the same number of Calories as running 1 mile.

- a. Gilda ran a 26-mile marathon. About how far would her sister have to swim to use the same number of Calories Gilda used during the marathon?
- b. Juan swims 5 miles a day. About how many miles would he have to run to use the same number of Calories used during his swim?

編碼：7(h)-4-1-21

在測試了許多樣品後，一家電力公司確定市場上每 1,000 個燈泡中大約有 2 個有缺陷。美國人每年購買超過 10 億個燈泡。估計這些燈泡中有多少有缺陷？**職業情境**

21. After testing many samples, an electric company determined that approximately 2 of every 1,000 light bulbs on the market are defective. Americans buy more than 1 billion light bulbs every year. Estimate how many of these bulbs are defective.

編碼：7(h)-4-1-22(A, B, C, D)

環保會議的組織者為與會者訂購按鈕。他們支付 18 美元購買 12 打按鈕。
寫下並解決比例來回答每個問題。假設價格與訂單大小成正比。

- (A) 4 打按鈕多少錢？ 社會情境
- (B) 50 打按鈕要多少錢？ 社會情境
- (C) 組織者可以花 27 美元購買多少枚鈕扣？ 社會情境
- (D) 組織者可以花 63 美元購買多少枚鈕扣？ 社會情境

- 22.** The organizers of an environmental conference order buttons for the participants. They pay \$18 for 12 dozen buttons. Write and solve proportions to answer each question. Assume that price is proportional to the size of the order.
- a. How much do 4 dozen buttons cost?
 - b. How much do 50 dozen buttons cost?
 - c. How many dozens of buttons can the organizers buy for \$27?
 - d. How many dozens of buttons can the organizers buy for \$63?

編碼：7(h)-4-1-23(A, B, C, D)

丹澤爾在籃球罰球比賽中前 15 次投籃命中了 10 次。在接下來的 100 次罰球中，他的成功率基本保持不變。寫出並解決每個部分的比例。將您的答案四捨五入為最接近的整數。

- (A) 您預計丹澤爾在接下來的 60 次投籃中大約會投進多少個球？職業情境
- (B) 您預計他在接下來的 80 次罰球中大約會罰球多少次？職業情境
- (C) 您預計丹澤爾要投進 30 次罰球大約需要多少次？職業情境
- (D) 您預計他要投多少次才能投中 45 次罰球？職業情境

23. Denzel makes 10 of his first 15 shots in a basketball free-throw contest. His success rate stays about the same for his next 100 free throws. Write and solve a proportion for each part. Round your answer to the nearest whole number.



Free-Throw Contest Contest		
Player	Attempts	Baskets
Denzel	15	10
Mitchell	10	5
Rachael	15	7
Zoe	15	6

- a. About how many baskets do you expect Denzel to make in his next 60 attempts?
- b. About how many free throws do you expect him to make in his next 80 attempts?
- c. About how many attempts do you expect Denzel to take to make 30 free throws?
- d. About how many attempts do you expect him to take to make 45 free throws?

編碼：7(h)-4-1-24、7(h)-4-1-25、7(h)-4-1-26、7(h)-4-1-28、7(h)-4-1-29、7(h)-4-1-30、7(h)-4-1-31

對於練習 24-31，求解每個方程。無情境

For Exercises 24–31, solve each equation.

24. $12.5 = 0.8x$

25. $\frac{x}{15} = \frac{20}{30}$

26. $\frac{x}{18} = 4.5$

27. $\frac{15.8}{x} = 0.7$

28. $245 = 0.25x$

29. $\frac{18}{x} = \frac{4.5}{1}$

30. $\frac{0.1}{48} = \frac{x}{960}$

31. $\frac{x}{900} = \frac{3.5}{15}$

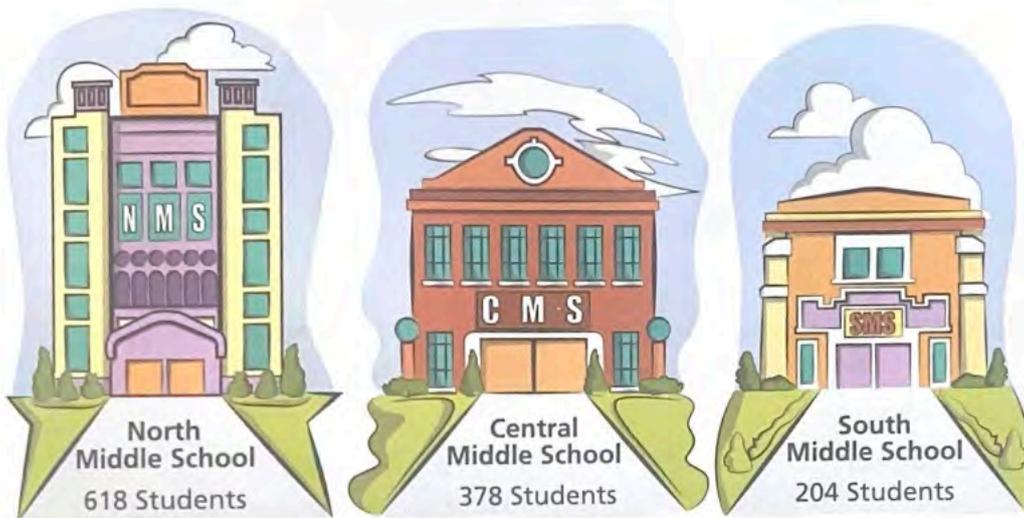
編碼：7(h)-4-1-32

(多選題) Middletown 為選定的中學生主辦了為期兩天的政府學習會議。米德爾敦有三所中學。假設有 20 名學生代表參加會議。每所學校與其人口的比例應該是公平的。每所學校應該選多少名？ 社會情境

- A. 北部：10 名代表，中部：8 名代表，南部：2 名代表
- B. 北區：11 名代表，中區：7 名代表，南區：2 名代表
- C. 北區：6 名代表，中區：3 名代表，南區：2 名代表
- D. 北區：10 名代表，中區：6 名代表，南區：4 名代表

32. Multiple Choice Middletown sponsors a two-day conference for selected middle-school students to study government. There are three middle schools in Middletown.

Suppose 20 student delegates will attend the conference. Each school should be represented fairly in relation to its population. How many should be selected from each school?



- A. North: 10 delegates, Central: 8 delegates, South: 2 delegates
- B. North: 11 delegates, Central: 7 delegates, South: 2 delegates
- C. North: 6 delegates, Central: 3 delegates, South: 2 delegates
- D. North: 10 delegates, Central: 6 delegates, South: 4 delegates

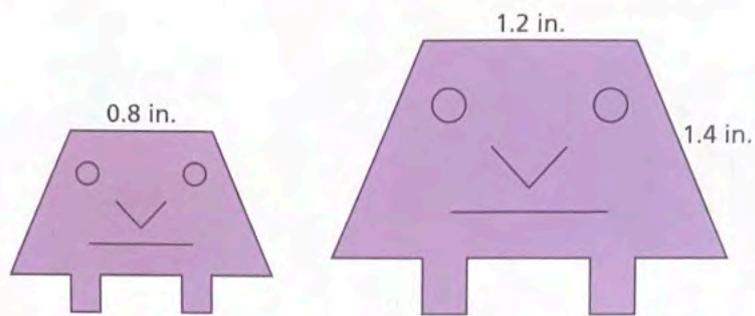
7(h)-4-1-33(A, B, C, D)

下面的草圖顯示了 Grump 家族的兩名成員。Grump 家族的人在幾何上是相似的。使用練習 33-36 中的數字

寫出比較 Grumps 中相應段長度的語句。每個概念至少使用一次。

- (A) 比例 個人情境
- (B) 分數 個人情境
- (C) 百分比 個人情境
- (D) 比例常數 個人情境

The sketches below show two members of the Grump family. The Grumps are geometrically similar. Use the figures for Exercises 33–36.



33. Write statements comparing the lengths of corresponding segments in the Grumps. Use each concept at least once.
- a. ratio
 - b. fraction
 - c. percent
 - d. scale factor

7(h)-4-1-34(A, B, C, D)

寫出比較 Grumps 的區域的陳述。每個概念至少使用一次

(A) 比例 個人情境

(B) 分數 個人情境

(C) 百分比 個人情境

(D) 比例常數 個人情境

34. Write statements comparing the areas of the Grumps. Use each concept at least once.

a. ratio

b. fraction

c. percent

d. scale factor

編碼：7(h)-4-1-35

較小 Grump 中與較大 Grump 中 1.4 英寸部分相對應的部分有多長 **個人情境**

- 35.** How long is the segment in the smaller Grump that corresponds to the 1.4-inch segment in the larger Grump?

編碼：7(h)-4-1-36

(多項選擇) 小的 Grump 嘴寬 0.6 英寸。大的 Grump 人的嘴有多寬？

A. 0.4 英寸 B. 0.9 英寸 C. 1 英寸 D. 1.2 英寸 **個人情境**

36. Multiple Choice The mouth of the smaller Grump is 0.6 inches wide. How wide is the mouth of the larger Grump?

A. 0.4 in.

B. 0.9 in.

C. 1 in.

D. 1.2 in.

編碼：7(h)-4-1-37

假設一則新聞報導「一項調查發現 $\frac{4}{7}$ 美國人在電視上觀看超級盃比賽。」Bishnu 認為這意味著調查涉及 7 人，其中 4 人觀看了超級節目電視上的超級盃。你同意他嗎？如果不是，那有什麼作用聲明的意思是？**社會情境**

37. Suppose a news story reports "A survey found that $\frac{4}{7}$ of all Americans watched the Super Bowl on television." Bishnu thinks this means the survey reached seven people and four of them watched the Super Bowl on television. Do you agree with him? If not, what does the statement mean?

編碼：7(h)-4-1-38(A, B,C)

水果吧長 5 英寸。該酒吧將被分成兩部分。對於每種情況，找出兩塊的長度。

(A) 一塊是整個酒吧的 $\frac{3}{10}$ 部分。個人情境

(B) 一塊佔酒吧的 60%。個人情境

(C) 一塊比另一塊長 1 英寸。個人情境

38. A fruit bar is 5 inches long. The bar will be split into two pieces. For each situation, find the lengths of the two pieces.

a. One piece is $\frac{3}{10}$ of the whole bar.

b. One piece is 60% of the bar.

c. One piece is 1 inch longer than the other.

編碼：7(h)-4-1-39

練習 38 包括幾個數字或數量：5 英寸、3、10、60% 和 1 英寸。確定每個數字或數量是指整體、部分還是兩個部分之間的差異。無情境

39. Exercise 38 includes several numbers or quantities: 5 inches, 3, 10, 60%, and 1 inch. Determine whether each number or quantity refers to the whole, a part, or the difference between two parts.

編碼：7(h)-4-1-40(A, B)

如果可能，將紅色塗料與白色塗料的比較更改為百分比比較。如果不可能，請解釋原因。

(A) 紅色油漆的混合物的分數是 $\frac{1}{4}$ 。個人情境

(B) 不同混合物中紅色與白色塗料的比例為 2 比 5。個人情境

40. If possible, change each comparison of red paint to white paint to a percent comparison. If it is not possible, explain why.

a. The fraction of a mix that is red paint is $\frac{1}{4}$.

b. The ratio of red to white paint in a different mix is 2 to 5.

編碼：7(h)-4-1-41(A, B)

如果可能，將每個比較更改為分數比較。如果不可能，請解釋原因。

(A)堅果混合物中含有 30% 的花生。個人情境

(B)混合物中杏仁與其他堅果的比例為 1 比 7。個人情境

41. If possible, change each comparison to a fraction comparison. If it is not possible, explain why.

a. A nut mix is 30% peanuts.

b. The ratio of almonds to other nuts in a mix is 1 to 7.

編碼：7(h)-4-1-42(A, B, C, D, E, F)

找出使每個句子正確的值

(A) $\frac{3}{10} = \frac{X}{30}$ 無情境

(B) $\frac{1}{2} > \frac{X}{20}$ 無情境

(C) $\frac{X}{20} > \frac{3}{5}$ 無情境

(D) $\frac{9}{30} \leq \frac{X}{15}$ 無情境

(E) $\frac{X}{12} \geq \frac{3}{4}$ 無情境

(F) $\frac{9}{21} = \frac{12}{X}$ 無情境

42. Find a value that makes each sentence correct.

a. $\frac{3}{10} = \frac{\blacksquare}{30}$

c. $\frac{\blacksquare}{20} > \frac{3}{5}$

e. $\frac{\blacksquare}{12} \geq \frac{3}{4}$

b. $\frac{1}{2} < \frac{\blacksquare}{20}$

d. $\frac{9}{30} \leq \frac{\blacksquare}{15}$

f. $\frac{9}{21} = \frac{12}{\blacksquare}$

編碼：7(h)-4-1-43(A, B, C, D, E)

使用(a)-(e)部分的表格。

(A) 55-64 歲年齡段的人步行鍛煉的比例是多少？社會情境

(B) 12-17 歲年齡段的人步行鍛煉的比例是多少？社會情境

(C) 寫一份比率聲明，比較 12 至 17 歲步行的人數與 55 至 64 歲步行的人數。使用近似數字來簡化比率。社會情境

(D) 寫一份比率聲明，比較 12 至 17 歲的人步行鍛煉的百分比與 55 至 64 歲的人步行鍛煉的百分比。社會情境

(E) 哪種形式的數據（步行者數量或百分比）會您用來比較不同群體中步行鍛煉的受歡迎程度？解釋。社會情境

43. Use the table for parts (a)–(e).

Participation in Walking for Exercise

	Age 12–17	Age 55–64
People Who Walk	5,520,000	12,595,000
Total in Group	25,056,000	31,556,000

SOURCE: U.S. Census Bureau

- What percent of the 55–64 age group walk for exercise?
- What percent of the 12–17 age group walk for exercise?
- Write a ratio statement to compare the number of 12- to 17-year-olds who walk to the number of 55- to 64-year-olds who walk. Use approximate numbers to simplify the ratio.
- Write a ratio statement to compare the percent of 12- to 17-year-olds who walk for exercise to the percent of 55- to 64-year-olds who walk for exercise.
- Which form of data—numbers of walkers or percents—would you use to compare the popularity of walking for exercise among various groups? Explain.

編碼：7(h)-4-1-44

複製下面的數軸。添加 0.25、 $\frac{6}{8}$ 、1 又 $\frac{3}{4}$ 和 1.3 的標記。無情境

44. Copy the number line below. Add labels for 0.25, $\frac{6}{8}$, $1\frac{3}{4}$, and 1.3.



編碼：7(h)-4-1-45

寫出兩個具有不同分母的不等分數。哪個分數更大嗎？解釋。無情境

45. Write two unequal fractions with different denominators. Which fraction is greater? Explain.

編碼：7(h)-4-1-46

寫出一個分數和一個小數，使得分數大於小數。解釋。無情境

46. Write a fraction and a decimal such that the fraction is greater than the decimal. Explain.

編碼：7(h)-4-1-47

複製練習 47-55 中的每對數字。插入 <、> 或 = 即可做出正確的陳述。無情境

4/5 11/12

Copy each pair of numbers in Exercises 47-55. Insert <, >, or = to make a true statement.

47. $\frac{4}{5} \blacksquare \frac{11}{12}$

48. $\frac{14}{21} \blacksquare \frac{10}{15}$

49. $\frac{7}{9} \blacksquare \frac{3}{4}$

50. $2.5 \blacksquare 0.259$

51. $30.17 \blacksquare 30.018$

52. $0.006 \blacksquare 0.0060$

53. $0.45 \blacksquare \frac{9}{20}$

54. $1\frac{3}{4} \blacksquare 1.5$

55. $\frac{1}{4} \blacksquare 1.3$

編碼：7(h)-4-1-48

(如編碼：7(h)-4-1-47 之題幹) 無情境

14/21 10/15

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5} \blacksquare \frac{11}{12}$

48. $\frac{14}{21} \blacksquare \frac{10}{15}$

49. $\frac{7}{9} \blacksquare \frac{3}{4}$

50. $2.5 \blacksquare 0.259$

51. $30.17 \blacksquare 30.018$

52. $0.006 \blacksquare 0.0060$

53. $0.45 \blacksquare \frac{9}{20}$

54. $1\frac{3}{4} \blacksquare 1.5$

55. $\frac{1}{4} \blacksquare 1.3$

編碼：7(h)-4-1-49

(如編碼：7(h)-4-1-47 之題幹) 無情境

7/9 3/4

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5} \blacksquare \frac{11}{12}$

48. $\frac{14}{21} \blacksquare \frac{10}{15}$

49. $\frac{7}{9} \blacksquare \frac{3}{4}$

50. $2.5 \blacksquare 0.259$

51. $30.17 \blacksquare 30.018$

52. $0.006 \blacksquare 0.0060$

53. $0.45 \blacksquare \frac{9}{20}$

54. $1\frac{3}{4} \blacksquare 1.5$

55. $\frac{1}{4} \blacksquare 1.3$

編碼：7(h)-4-1-50

(如編碼：7(h)-4-1-47 之題幹) 無情境

2.5 0.259

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5}$ ■ $\frac{11}{12}$

48. $\frac{14}{21}$ ■ $\frac{10}{15}$

49. $\frac{7}{9}$ ■ $\frac{3}{4}$

50. 2.5 ■ 0.259

51. 30.17 ■ 30.018

52. 0.006 ■ 0.0060

53. 0.45 ■ $\frac{9}{20}$

54. $1\frac{3}{4}$ ■ 1.5

55. $\frac{1}{4}$ ■ 1.3

編碼：7(h)-4-1-51

(如編碼：7(h)-4-1-47 之題幹) 無情境

30.17 30.018

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5} \blacksquare \frac{11}{12}$

48. $\frac{14}{21} \blacksquare \frac{10}{15}$

49. $\frac{7}{9} \blacksquare \frac{3}{4}$

50. $2.5 \blacksquare 0.259$

51. $30.17 \blacksquare 30.018$

52. $0.006 \blacksquare 0.0060$

53. $0.45 \blacksquare \frac{9}{20}$

54. $1\frac{3}{4} \blacksquare 1.5$

55. $\frac{1}{4} \blacksquare 1.3$

編碼：7(h)-4-1-52

(如編碼：7(h)-4-1-47 之題幹) 無情境

0.006 0.0060

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5}$ ■ $\frac{11}{12}$

48. $\frac{14}{21}$ ■ $\frac{10}{15}$

49. $\frac{7}{9}$ ■ $\frac{3}{4}$

50. 2.5 ■ 0.259

51. 30.17 ■ 30.018

52. 0.006 ■ 0.0060

53. 0.45 ■ $\frac{9}{20}$

54. $1\frac{3}{4}$ ■ 1.5

55. $\frac{1}{4}$ ■ 1.3

編碼：7(h)-4-1-53

(如編碼：7(h)-4-1-47 之題幹) 無情境

0.45 9/20

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5}$ ■ $\frac{11}{12}$

48. $\frac{14}{21}$ ■ $\frac{10}{15}$

49. $\frac{7}{9}$ ■ $\frac{3}{4}$

50. 2.5 ■ 0.259

51. 30.17 ■ 30.018

52. 0.006 ■ 0.0060

53. 0.45 ■ $\frac{9}{20}$

54. $1\frac{3}{4}$ ■ 1.5

55. $\frac{1}{4}$ ■ 1.3

編碼：7(h)-4-1-54

(如編碼：7(h)-4-1-47 之題幹) 無情境

$$1\frac{2}{4} \quad 1.5$$

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5} \blacksquare \frac{11}{12}$

48. $\frac{14}{21} \blacksquare \frac{10}{15}$

49. $\frac{7}{9} \blacksquare \frac{3}{4}$

50. $2.5 \blacksquare 0.259$

51. $30.17 \blacksquare 30.018$

52. $0.006 \blacksquare 0.0060$

53. $0.45 \blacksquare \frac{9}{20}$

54. $1\frac{3}{4} \blacksquare 1.5$

55. $\frac{1}{4} \blacksquare 1.3$

編碼：7(h)-4-1-55

(如編碼：7(h)-4-1-47 之題幹) 無情境

$\frac{1}{4}$ 1.3

Copy each pair of numbers in Exercises 47-55. Insert $<$, $>$, or $=$ to make a true statement.

47. $\frac{4}{5} \blacksquare \frac{11}{12}$

48. $\frac{14}{21} \blacksquare \frac{10}{15}$

49. $\frac{7}{9} \blacksquare \frac{3}{4}$

50. $2.5 \blacksquare 0.259$

51. $30.17 \blacksquare 30.018$

52. $0.006 \blacksquare 0.0060$

53. $0.45 \blacksquare \frac{9}{20}$

54. $1\frac{3}{4} \blacksquare 1.5$

55. $\frac{1}{4} \blacksquare 1.3$

編碼：7(h)-4-1-56

假設一則新聞報導「超級盃體育場內 90% 的人年齡在 25 歲到 55 歲之間」。艾麗西亞認為，這意味著體育場內只有 100 人，其中 90 人年齡在 25 至 55 歲之間。你同意她的觀點嗎？如果不是，該聲明是什麼意思？**社會情境**

56. Suppose a news story reports “90% of the people in the Super Bowl stadium were between the ages of 25 and 55.” Alicia thinks this means only 100 people were in the stadium, and 90 of them were between 25 and 55 years of age. Do you agree with her? If not, what does the statement mean?

編碼：7(h)-4-1-57

(多選) 選擇讓 $\frac{18}{32} = \frac{\square}{16}$ 正確的值。無情境

F.7

G.8

H.9

J.10

57. Multiple Choice Choose the value that makes $\frac{18}{32} = \frac{\square}{16}$ correct.

F. 7

G. 8

H. 9

J. 10

編碼：7(h)-4-1-58

(多選) 選擇使 $\frac{\square}{30} \leq \frac{6}{20}$ 正確的值。無情境

- A. 9
- B. 10
- C. 11
- D. 12

58. **Multiple Choice** Choose the value that makes $\frac{\square}{30} \leq \frac{6}{20}$ correct.

A. 9

B. 10

C. 11

D. 12

編碼：7(h)-4-1-59(A, B, C, D)

找出使每個句子正確的值。解釋每種情況下你的推理。

(A) $\frac{3}{4} = \frac{\square}{12}$ 無情境

(B) $\frac{3}{4} < \frac{\square}{12}$ 無情境

(C) $\frac{3}{4} > \frac{\square}{12}$ 無情境

(D) $\frac{9}{12} = \frac{12}{\square}$ 無情境

59. Find a value that makes each sentence correct. Explain your reasoning in each case.

a. $\frac{3}{4} = \frac{\square}{12}$

b. $\frac{3}{4} < \frac{\square}{12}$

c. $\frac{3}{4} > \frac{\square}{12}$

d. $\frac{9}{12} = \frac{12}{\square}$

編碼：7(h)-4-1-60(A, B, C, D)

找出使每個句子正確的值

(A) $\frac{6}{8} = \frac{\square}{12} = \frac{\square}{16}$ 無情境

(B) $\frac{\square}{9} = \frac{8}{12} = \frac{\square}{21}$ 無情境

(C) $\frac{\square}{60} = \frac{\square}{75} = \frac{6}{90}$ 無情境

(D) $\frac{\square}{4} = \frac{15}{\square} = \frac{24}{16}$ 無情境

60. Find values that make each sentence correct.

a. $\frac{6}{8} = \frac{\square}{12} = \frac{\square}{16}$

b. $\frac{\square}{9} = \frac{8}{12} = \frac{\square}{21}$

c. $\frac{\square}{60} = \frac{\square}{75} = \frac{6}{90}$

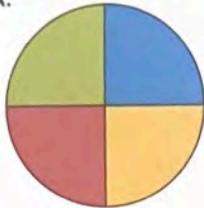
d. $\frac{\square}{4} = \frac{15}{\square} = \frac{24}{16}$

編碼：7(h)-4-1-61

(多選) Ayanna 正在製作一個用於學校嘉年華的圓形旋轉器。她希望對旋轉器進行劃分，使 30% 的區域為藍色，20% 為紅色，15% 為綠色，35% 為黃色。選擇符合描述的微調器。個人情境

61. **Multiple Choice** Ayanna is making a circular spinner to be used at the school carnival. She wants the spinner to be divided so that 30% of the area is blue, 20% is red, 15% is green, and 35% is yellow. Choose the spinner that fits the description.

A.



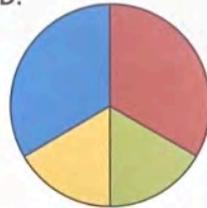
B.



C.



D.



編碼：7(h)-4-1-62

漢娜正在製作她自己的圓形旋轉器。她將綠色與黃色的比例設置為 2:1，紅色與黃色的比例設置為 3:1，藍色與綠色的比例設置為 2:1。畫出她的旋轉器的草圖。個人情境

62. Hannah is making her own circular spinner. She makes the ratio of green to yellow 2 : 1, the ratio of red to yellow 3 : 1, and the ratio of blue to green 2 : 1. Make a sketch of her spinner.

編碼：7(h)-4-1-63(A, B, C, D, E)

在坐標平面上繪製點(8,6)、(8,22)和(24,14)。

(A) 將它們連接起來形成一個三角形。無情境

(B) 繪製將規則(0.5x, 0.5y)應用於(a)部分中的三個點時得到的三角形。無情境

(C) 三角形中對應邊的長度是如何計算出來的(a)和(b)部分相關嗎？無情境

(D) 小三角形的面積佔大三角形面積的百分之幾更大的三角形？無情境

(E) 大三角形的面積是小三角形面積的百分之幾？無情境

- 63.**
- Plot the points (8, 6), (8, 22), and (24, 14) on a coordinate plane. Connect them to form a triangle.
 - Draw the triangle you get when you apply the rule (0.5x, 0.5y) to the three points from part (a).
 - How are lengths of corresponding sides in the triangles from parts (a) and (b) related?
 - The area of the smaller triangle is what percent of the area of the larger triangle?
 - The area of the larger triangle is what percent of the area of the smaller triangle?

編碼：7(h)-4-1-64(A, B, C)

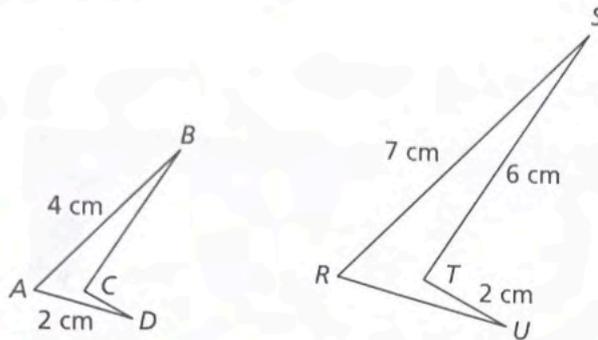
下面的多邊形是相似的。

(A) BC 邊長是多少？解釋你的推理。無情境

(B) RU 的邊長是多少？解釋你的推理。無情境

(C) CD 邊長是多少？解釋你的推理。無情境

64. The polygons below are similar.



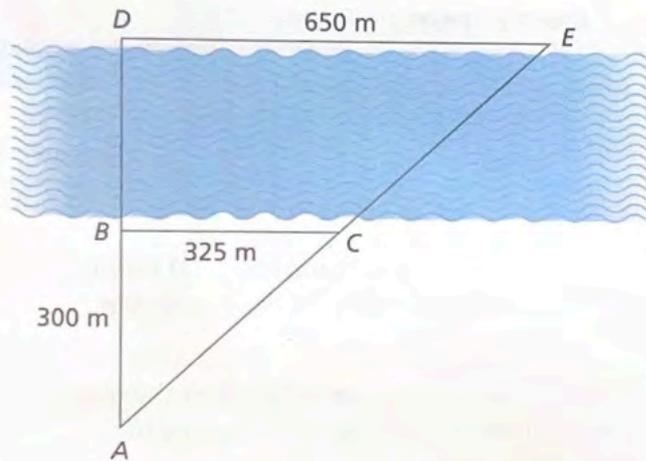
- What is the length of side BC ? Explain your reasoning.
- What is the length of side RU ? Explain your reasoning.
- What is the length of side CD ? Explain your reasoning.

編碼：7(h)-4-1-65(A, B)

Yoshi 和 Kai 正在努力獲得戶外教育課程的證書。他們的任務是測量寬度一條河。他們的報告包括一個顯示他們工作的圖表。

- (A) 你認為他們是如何得出 AB 、 BC 和 DE 線段的長度的？科學情境
- (B) 如何利用線段 AB 、 BC 、 DE 求出河流的寬度？科學情境

65. Yoshi and Kai are trying to earn a certificate in their Outdoor Education Class. They have the task of measuring the width of a river. Their report includes a diagram that shows their work.

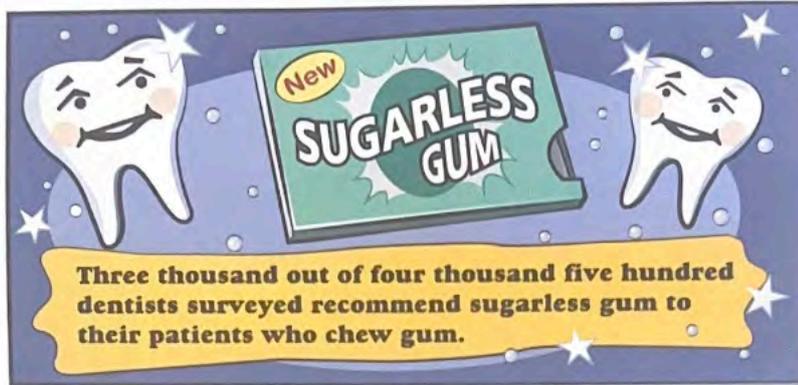


- a. How do you think they came up with the lengths of the segments AB , BC , and DE ?
- b. How can they use segments AB , BC , and DE to find the width of the river?

編碼：7(h)-4-1-66

重寫此廣告，使其更加有效。職業情境

66. Rewrite this ad so that it will be more effective.



編碼：7(h)-4-1-67(A, B)

使用下表。

(A) 將在家吃的食物和在外吃的食物所花費的錢與每年的食物總花費進行比較。寫下每年的報表。個人情境

(B) 解釋一下你在(a)部分中所寫的報表如何顯示花在外出食物上的錢相對於食物上的總支出的增加或減少。個人情境

67. Use the table below.

Money Spent on Food

Where Food Is Eaten	2002	2010
Home	\$471,533,000,000	\$617,475,000,000
Away from Home	\$295,341,000,000	\$446,442,000,000

SOURCE: U.S. Census Bureau

- Compare money spent on food eaten at home and food eaten away from home to the total amount spent on food each year. Write statements for each year.
- Explain how the statements you wrote in part (a) show the money spent on food away from home increasing or decreasing in relation to the total spent on food.

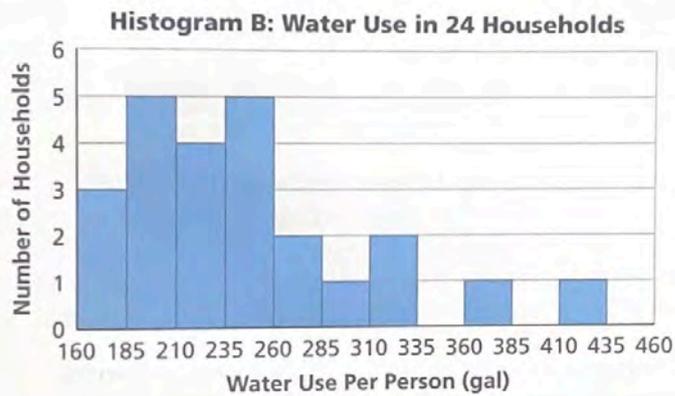
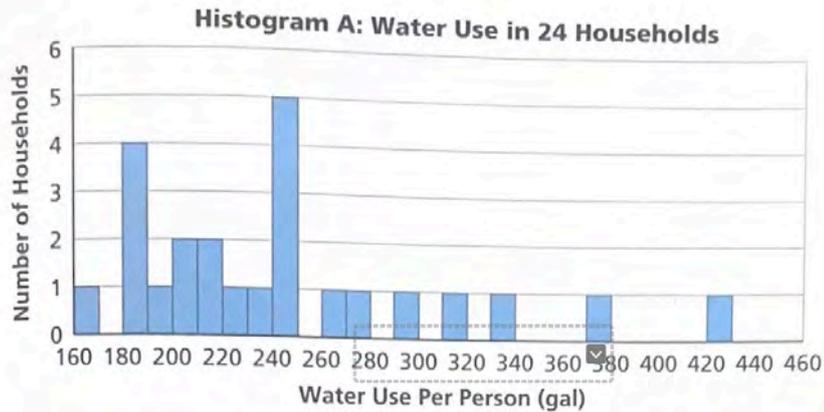
編碼：7(h)-4-1-68(A, B)

下面的兩個直方圖顯示了 24 個家庭每週人均用水加侖數的信息

(A) 比較兩個直方圖並解釋它們有何不同。社會情境。

(B) 直方圖 A 和 B 中的數據似乎聚集在哪裡？社會情境

68. The two histograms below display information about gallons of water used per person in 24 households in a week.



- Compare the two histograms and explain how they differ.
- Where do the data seem to clump in Histograms A and B?

編碼：7(h)-4-1-69

下表顯示了一家小型媒體公司的廣告支出。使用練習 69-74 的表格。
2000 年和 2010 年哪個廣告位的廣告費差異最大？職業情境

The table below shows advertising spending for a small media company. Use the table for Exercises 69–74.

Advertising Spending		
Placement	2000	2010
Newspapers	\$32,415	\$18,203
Magazines	\$4,973	\$7,728
Television	\$19,318	\$35,718
Radio	\$5,126	\$11,318
Yellow Pages	\$4,984	\$1,327
Internet	\$1,934	\$7,548
Direct Mail	\$13,497	\$8,458
Other	\$13,194	\$19,345
Total	\$95,441	\$109,645

69. Which placement has the greatest difference in advertising dollars between 2000 and 2010?

編碼：7(h)-4-1-70

(如編碼：7(h)-4-1-69 之題幹)

找出 2000 年一種類型的廣告投放所花費的廣告費用百分比。職業情境

The table below shows advertising spending for a small media company. Use the table for Exercises 69–74.

Advertising Spending		
Placement	2000	2010
Newspapers	\$32,415	\$18,203
Magazines	\$4,973	\$7,728
Television	\$19,318	\$35,718
Radio	\$5,126	\$11,318
Yellow Pages	\$4,984	\$1,327
Internet	\$1,934	\$7,548
Direct Mail	\$13,497	\$8,458
Other	\$13,194	\$19,345
Total	\$95,441	\$109,645

70. Find the percent of advertising dollars spent for one type of placement in 2000.

編碼：7(h)-4-1-71

(如編碼：7(h)-4-1-69 之題幹)

用百分比找出 2010 年一種投放類型所花費的廣告費。職業情境

The table below shows advertising spending for a small media company. Use the table for Exercises 69–74.

Advertising Spending		
Placement	2000	2010
Newspapers	\$32,415	\$18,203
Magazines	\$4,973	\$7,728
Television	\$19,318	\$35,718
Radio	\$5,126	\$11,318
Yellow Pages	\$4,984	\$1,327
Internet	\$1,934	\$7,548
Direct Mail	\$13,497	\$8,458
Other	\$13,194	\$19,345
Total	\$95,441	\$109,645

71. Find the percent of advertising dollars spent for one type of placement in 2010.

編碼：7(h)-4-1-72

(如編碼：7(h)-4-1-69 之題幹)

使用練習 70 和 71 中的結果。寫幾個句子來描述從 2000 年到 2010 年廣告支出的變化。職業情境

The table below shows advertising spending for a small media company. Use the table for Exercises 69–74.

Advertising Spending		
Placement	2000	2010
Newspapers	\$32,415	\$18,203
Magazines	\$4,973	\$7,728
Television	\$19,318	\$35,718
Radio	\$5,126	\$11,318
Yellow Pages	\$4,984	\$1,327
Internet	\$1,934	\$7,548
Direct Mail	\$13,497	\$8,458
Other	\$13,194	\$19,345
Total	\$95,441	\$109,645

- 72.** Use your results from Exercises 70 and 71. Write several sentences describing how advertising spending changed from 2000 to 2010.

編碼：7(h)-4-1-73

(如編碼：7(h)-4-1-69 之題幹)

假設您正在考慮投資互聯網廣告或廣播電台廣告。哪種比較廣告成本（差異或百分比）的方法使互聯網看起來是更好的投資？這使得廣播電台看起來是更好的投資？**職業情境**

The table below shows advertising spending for a small media company. Use the table for Exercises 69–74.

Advertising Spending		
Placement	2000	2010
Newspapers	\$32,415	\$18,203
Magazines	\$4,973	\$7,728
Television	\$19,318	\$35,718
Radio	\$5,126	\$11,318
Yellow Pages	\$4,984	\$1,327
Internet	\$1,934	\$7,548
Direct Mail	\$13,497	\$8,458
Other	\$13,194	\$19,345
Total	\$95,441	\$109,645

- 73.** Suppose you were thinking about investing in Internet advertising or radio station advertising. Which method of comparing advertising costs (differences or percents) makes the Internet seem the better investment? Which makes the radio station seem the better investment?

編碼：7(h)-4-1-74

(如編碼：7(h)-4-1-69 之題幹)

假設您是一名記者，正在撰寫一篇有關廣告隨時間變化的趨勢的文章。您會選擇哪種比較方法？解釋。職業情境

The table below shows advertising spending for a small media company. Use the table for Exercises 69–74.

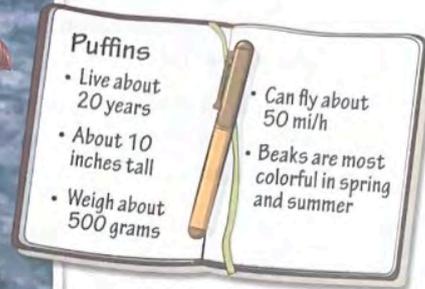
Advertising Spending		
Placement	2000	2010
Newspapers	\$32,415	\$18,203
Magazines	\$4,973	\$7,728
Television	\$19,318	\$35,718
Radio	\$5,126	\$11,318
Yellow Pages	\$4,984	\$1,327
Internet	\$1,934	\$7,548
Direct Mail	\$13,497	\$8,458
Other	\$13,194	\$19,345
Total	\$95,441	\$109,645

74. Suppose you are a reporter writing an article about trends in advertising over time. Which method of comparison would you choose? Explain.

編碼：7(h)-4-1-75

安吉拉是一位生物學家，在阿拉斯加的一個島上度過夏天。幾個夏天她都在研究海雀。兩年前的夏天，安吉拉捕獲、標記並釋放了 20 隻海雀。去年夏天，她捕獲了 50 隻海雀，發現其中 2 隻被貼上了標籤。利用安吉拉的發現，估計島上海雀的數量。解釋你的推理。科學情境

75. Angela, a biologist, spends summers on an island in Alaska. For several summers she studied puffins. Two summers ago, Angela captured, tagged, and released 20 puffins. This past summer, she captured 50 puffins and found that 2 of them were tagged. Using Angela's findings, estimate the number of puffins on the island. Explain your reasoning.



編碼：7(h)-4-1-76

麗塔想要估計一個大罐子裡有多少豆子。她拿出 100 顆豆子並做了標記。然後她將它們放回罐子中，並將它們與未標記的豆子混合。然後，她從罐子裡取出豆子樣本來收集一些數據。使用她的數據來預測罐子裡的豆子數量

樣本標記的豆子數量：2

樣品中的豆子：30 科學情境

76. Rita wants to estimate the number of beans in a large jar. She takes out 100 beans and marks them. Then she returns them to the jar and mixes them with the unmarked beans. She then gathers some data by taking a sample of beans from the jar. Use her data to predict the number of beans in the jar.

Sample
Number of marked beans: 2
Beans in sample: 30

編碼：7(h) -4-1-77(A, B, C)

下圖是在厘米網格上繪製的

(A) 在比這裡顯示的那些較大正方形組成的網格上，畫一個類似於這個圖的圖。原始圖形到您的繪圖的比例因子是多少？無情境

(B) 再畫一個類似的圖形，但是使用比比處顯示的那些更小的正方形網格，原始圖形到您的繪圖的比例因子是多少？無情境

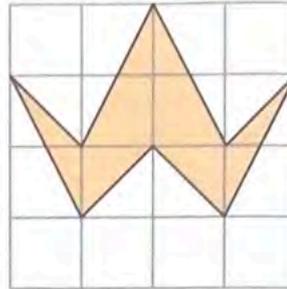
(C) 比較原圖形和它的周長和面積每種情況都進行複製（放大和縮小）。解釋一下如何這些值與每種情況下的比例因子相關。無情境

77. The picture below is drawn on a centimeter grid.

a. On a grid made of larger squares than those shown here, draw a figure similar to this figure. What is the scale factor from the original figure to your drawing?

b. Draw another similar figure, but use a grid of smaller squares than those shown here. What is the scale factor from the original figure to your drawing?

c. Compare the perimeters and areas of the original figure and its copy in each case (enlargement and reduction). Explain how these values are related to the scale factor in each case.



7(h)-4-1-78(A, B, C)

美國人民在國會中有代表，國會由眾議院和參議院組成。

(A) 在眾議院中，代表人數每個州都有所不同。根據您對國會的了解，每個州的代表人數是如何確定的？社會情境

(B) 每個州的參議員人數是如何確定的？社會情境

(C) 比較兩種確定國會代表權的方法。對於人口眾多的國家來說，這兩種代表形式有何優缺點？對於人口較少的州又如何呢？社會情境

78. The people of the United States are represented in Congress, which is made up of the House of Representatives and the Senate.

- a.** In the House of Representatives, the number of representatives from each state varies. From what you know about Congress, how is the number of representatives from each state determined?
- b.** How is the number of senators from each state determined?
- c.** Compare the two methods of determining representation in Congress. What are the advantages and disadvantages of these two forms of representation for states with large populations? How about for states with small populations?

編碼：7(h)-4-2-1

披薩派對上的客人坐在三張桌子上。小桌子有 5 個座位和 2 個披薩。中號桌子有 7 個座位和 3 個披薩。大桌子有 12 個座位和 5 個披薩。每桌的披薩都是平分的。客人在哪張桌子上得到的披薩最多？個人情境

1. Guests at a pizza party are seated at three tables. The small table has 5 seats and 2 pizzas. The medium table has 7 seats and 3 pizzas. The large table has 12 seats and 5 pizzas. The pizzas at each table are shared equally. At which table does a guest get the most pizza?

編碼：7(h)-4-2-2

假設有關於超級盃的新聞報導稱「體育場內男性人數與女性人數的比例為 9 比 5。Haru 認為這意味著體育場裡有 14 個人——9 男 5 女。你同意哈魯的觀點嗎？為什麼或者為什麼不？社會情境

2. Suppose a news story about the Super Bowl claims "Men outnumbered women in the stadium by a ratio of 9 to 5." Haru thinks that this means there were 14 people in the stadium—9 men and 5 women. Do you agree with Haru? Why or why not?

編碼：7(h)-4-2-3

(選擇題) 以下哪一項是對「男性人數與女性人數之比為 9 比 5」這一說法的正確解釋？社會情境

- A 男性比女性多四個。
- B 男性人數是女性人數的 1.8 倍。
- C 男性人數除以女性人數等於 $5 \div 9$ 。
- D 在體育場內，九名球迷中有五名是女性。

3. **Multiple Choice** Which of the following is a correct interpretation of the statement "Men outnumbered women by a ratio of 9 to 5?"
- A. There were four more men than women.
 - B. The number of men was 1.8 times the number of women.
 - C. The number of men divided by the number of women was equal to the quotient of $5 \div 9$.
 - D. In the stadium, five out of nine fans were women.

編碼：7(h)-4-2-4

每個工作日，新聞報道都會報導上漲（價格上漲）的股票數量和下跌（價格下跌）的股票數量。對於以下每一對報告，確定哪一個報告對投資者來說是更好的消息

- a. 上漲數量與下跌數量之比為 5 比 3。或者上漲數量與下跌數量之比為 7 比 5。
- b. 上漲數量與下跌數量之比為 9 比 5。或者上漲數量與下跌數量之比為 6 比 3。
- c. 上漲數量與下跌數量之比為 10 比 7。或者上漲數量與下跌數量之比為 6 比 4。

個人情境

4. Each business day, news reports tell the number of stocks that gained (went up in price) and the number that declined (went down in price). For each of the following pairs of reports, determine which report is better news for investors.

a. Gains outnumber declines by a ratio of 5 to 3.

OR

Gains outnumber declines by a ratio of 7 to 5.

b. Gains outnumber declines by a ratio of 9 to 5.

OR

Gains outnumber declines by a ratio of 6 to 3.

c. Gains outnumber declines by a ratio of 10 to 7.

OR

Gains outnumber declines by a ratio of 6 to 4.

編碼：7(h)-4-2-5

關於符號的註釋數學家使用省略號來表示模式的延續。例如，您可以通過寫 1、2、3、...和 10 來引用 1 到 10 之間的數字列表，而不是列出每個數字。您也可以在其他時間間隔內執行此操作。例如，6、9、12、...和 30 指的是 6 到 30 中每個 3 的倍數的列表。對於練習 5-11，在比率中使用正確的測量單位你計算一下。

Maralah 可以使用 20 加侖汽油以穩定的速度駕駛她的汽車 580 英里。製作一個費率表，顯示她的汽車使用 1、2、3、...、10 加侖汽油可以行駛的英里數。個人情境

Note on Notation Mathematicians use ellipses to indicate the continuation of a pattern. For example, you can refer to the list of numbers between 1 and 10 by writing 1, 2, 3, . . . , and 10, rather than listing each number. You can do this for other intervals as well. For example, 6, 9, 12, . . . , and 30 refers to the list of every multiple of 3 from 6 to 30.

For Exercises 5–11, use correct measurement units in the rates you compute.

5. Maralah can drive her car 580 miles at a steady speed using 20 gallons of gasoline. Make a rate table to show the number of miles she can drive her car for 1, 2, 3, . . . , and 10 gallons of gas.

編碼：7(h)-4-2-6

喬爾可以使用 15 加侖汽油以穩定的速度駕駛他的汽車 450 英里。製作一張費率表，顯示他的汽車使用 1、2、3、...、10 加侖汽油可以行駛的英里數。

個人情境

6. Joel can drive his car 450 miles at a steady speed using 15 gallons of gasoline. Make a rate table showing the number of miles he can drive his car for 1, 2, 3, . . . , and 10 gallons of gas.

編碼：7(h)-4-2-7(A, B, C, D)

Franky's Trail Mix Factory 向客戶提供下表中的信息。使用表中的模式回答問題。

- (A) 菲奧娜吃了 75 克什錦乾果。她吃了多少卡路里？職業情境
- (B) Rico 吃含有 1,000 卡路里的混合乾果。他吃了多少克混合乾？職業情境
- (C) 一個方程來表示任意克數混合乾的卡路里。職業情境
- (D) 寫一個方程來表示混合乾果的克數，可以提供任何人給定的卡路里數。職業情境

7. Franky's Trail Mix Factory gives customers the information in the table below. Use the pattern in the table to answer the questions.

- a. Fiona eats 75 grams of trail mix. How many Calories does she eat?
- b. Rico eats trail mix containing 1,000 Calories. How many grams of trail mix does he eat?
- c. Write an equation to represent the number of Calories in any number of grams of trail mix.
- d. Write an equation to represent the number of grams of trail mix that will provide any given number of Calories.

**Caloric Content
of Franky's Trail Mix**

Grams of Trail Mix	Calories
50	150
150	450
300	900
500	1,500

編碼：7(h)-4-2-8(A, B, C)

在營地，Miriam 使用陶輪在 2 小時內製作了 3 個碗。Duane 在 3 小時內做了 5 碗。

- (A) 米里亞姆和杜安誰製作的更快？ 個人情境
- (B) Miriam 製作一套 12 個碗需要多長時間？ 個人情境
- (C) Duane 製作一套 12 個碗需要多長時間？ 個人情境

8. At camp, Miriam uses a pottery wheel to make 3 bowls in 2 hours. Duane makes 5 bowls in 3 hours.
- Who makes bowls faster, Miriam or Duane?
 - How long will it take Miriam to make a set of 12 bowls?
 - How long will it take Duane to make a set of 12 bowls?

編碼：7(h)-4-2-9(A, B, C, D, E)

該乳品廠使用 50 磅牛奶生產 5 磅切達干酪。

(A) 製作一個費率表，顯示製作 5、10、15、20、...和 50 磅切達干酪所需的牛奶量。職業情境

(B) 繪製牛奶磅數和切達干酪磅數之間的關係圖。首先，決定哪個變量應該繼續每個軸。職業情境

(C) 寫出牛奶的磅數 m 與的磅數之間的方程式切達干酪 c 。職業情境

(D) (c)部分方程中的比例常數是多少？職業情境

(E) 解釋每種方法的一個優點（圖表、表格、和方程）來表達牛奶和切達干酪產量之間的關係。職業情境

9. The dairy uses 50 pounds of milk to make 5 pounds of cheddar cheese.



- Make a rate table showing the amount of milk needed to make 5, 10, 15, 20, . . . , and 50 pounds of cheddar cheese.
- Graph the relationship between pounds of milk and pounds of cheddar cheese. First, decide which variable should go on each axis.
- Write an equation relating pounds of milk m to pounds of cheddar cheese c .
- What is the constant of proportionality in your equation from part (c)?
- Explain one advantage of each method (the graph, the table, and the equation) to express the relationship between milk and cheddar cheese production.

編碼：7(h)-4-2-10(A, B, C, D)

(A) 基利從音樂網站購買歌曲。她花費 26.25 美元購買了 35 首歌曲。每首歌的價格是多少？個人情境

(B) 雷吉娜獲得了一張 50 美元的音樂網站禮品卡。她嘗試估計用禮品卡可以購買多少首歌曲。哪個估計是最合理？解釋。個人情境

i. 30 到 50 首歌曲

ii. 大約 70 首歌曲，但不到 70 首三。

iii 大約 70 首歌曲，但超過 70

iv 至少 90 首歌曲

(C) 複製並填寫下表。個人情境

(D) 盧修斯和哈維爾討論如何編寫有關價格和歌曲數量的方程式。Lucius 寫出方程 $n=0.75C$ 。哈維爾寫出方程 $C=0.75n$ 。你同意盧修斯還是哈維爾的觀點？使用(a)-(c)部分的信息進行解釋。個人情境

10. a. Keeley buys songs from a music website. She buys 35 songs for \$26.25. What is the price per song?
- b. Regina gets a \$50 gift card for the music site. She tries to estimate how many songs she can buy with the gift card. Which estimate is the most reasonable? Explain.
- i. between 30 and 50 songs
 - ii. around 70 songs, but less than 70
 - iii. around 70 songs, but more than 70
 - iv. at least 90 songs
- c. Copy and complete the table below.

Prices of Songs

Number of Songs, n	35	■	50	1	70	■
Cost, C	\$26.25	\$3	■	■	■	\$15

- d. Lucius and Javier discuss how to write an equation relating price and number of songs. Lucius writes the equation $n = 0.75C$. Javier writes the equation $C = 0.75n$. Do you agree with Lucius or with Javier? Use the information from parts (a)-(c) to explain.

編碼：7(h)-4-2-11(A, B)

(A) 一些學生想知道哪一個更划算，2.82 美元的 40 件裝鉛筆頭橡皮擦和 12 美元的 2 件裝鉛筆頭橡皮擦更好。他們使用不同的方法來得出答案。這些方法中哪些是正確的？您更喜歡哪種方法？解釋。個人情境
科特尼-比較兩個單位價格，確定哪個單位價格較便宜。

$$\frac{2.82}{40} = \frac{x}{1} \quad x = 0.0705 = \text{每個橡皮擦 } \$0.07 \quad \frac{0.12}{2} = \frac{x}{1} \quad x = 0.06 = \text{每個橡皮擦}$$

$\$0.06$ 2 件裝比每個橡皮擦價格便宜

艾略特：如果一個兩個一包的橡皮擦要 0.12 美元，那麼 20 個兩個一包的橡皮擦數量就和一個 40 包的橡皮擦數量相同。20 個兩個一包的橡皮擦價格為： $20 \times 0.12 = 2.4 = 2.40$ 美元 由於一個 40 包的橡皮擦價格是 2.82 美元，所以兩個一包的橡皮擦的單價更便宜。基米：如果 40 件裝的售價為 2.82 美元，那麼一半裝（20 個橡皮擦）的售價應為 1.41 美元。10 件 2 件裝（還有 20 個橡皮擦）應售價 1.20 美元。這個比較便宜。使用 2 件裝的橡皮擦價格較便宜。

(B) 描述另一種可用於確定哪種更值得購買的方法。個人情境

11. a. Several students wonder which is a better buy, a 40-pack of pencil-top erasers for \$2.82 or a 2-pack of pencil-top erasers for \$.12. They use different methods to arrive at an answer. Which of these methods are correct? Which method do you prefer? Explain.

Courtney

Compare the two unit rates to determine which unit rate is cheaper.

$$\frac{2.82}{40} = \frac{x}{1} \quad x = 0.0705 = \$0.07 \text{ per eraser}$$

$$\frac{0.12}{2} = \frac{x}{1} \quad x = 0.06 = \$0.06 \text{ per eraser}$$

The 2-packs have a cheaper per-eraser price.

Elliot

If I buy 40 of the 2-packs of erasers, the total cost will be $40 \times 0.12 = 4.8 = \$4.80$

That is more expensive than spending \$2.82 for a 40-pack of erasers. The 40-pack is the better deal.

Julio

If a 2-pack costs \$.12, then twenty 2-packs would have the same number of erasers as the 40-pack. Twenty 2-packs cost $20 \times 0.12 = 2.4 = \$2.40$

Since a 40-pack costs \$2.82, the price per eraser of the 2-packs is cheaper.

Kimi

If a 40-pack costs \$2.82, then half of the pack (20 erasers) should cost \$1.41.

Ten 2-packs (also 20 erasers) should cost \$1.20. This is cheaper. The price per eraser is cheaper using the 2-packs.

- b. Describe another method you can use to determine which is the better buy.

7(h)-4-2-12(A, B, C)

對於每種情況，找到一個單位比率並寫出與這兩個量相關的方程。

(A) 3 打蘋果 4.5 美元 無情境

(B) 30 瓶水 4.80 美元 無情境

(C) 24 盎司馬蘇里拉奶酪 2.88 美元 無情境

12. For each situation, find a unit rate and write an equation relating the two quantities.

a. 3 dozen apples for \$4.50

b. 30 bottles of water for \$4.80

c. 24 ounces of mozzarella cheese for \$2.88

編碼：7(h)-4-2-13

這些物品中哪一個更值得購買？個人情境

- A. 8 支裝膠棒售價 3.99 美元或 1 支膠棒售價 0.54 美元
- B. 12 包膠帶 2.50 美元或 1 卷膠帶 0.19 美元
- C. 100 支裝鉛筆售價 4.88 美元，或 1 支鉛筆售價 0.05 美元
- D. 50 包回形針，售價 0.89 美元或 25 包回形針 0.45 美元

13. Which of these items is the better buy?

- a. an 8-pack of glue sticks for \$3.99 or 1 glue stick for \$.54
- b. a 12-pack of tape for \$2.50 or 1 roll of tape for \$.19
- c. a 100-pack of pencils for \$4.88 or 1 pencil for \$.05
- d. a 50-pack of paper clips for \$.89 or a 25-pack of paper clips for \$.45

編碼：7(h)-4-2-14(A, B, C, D)

找出使每個句子正確的值

(A) $\frac{6}{14} = \frac{\square}{21} = \frac{\square}{28}$ 無情境

(B) $\frac{\square}{27} = \frac{8}{36} = \frac{\square}{63}$ 無情境

(C) $\frac{\square}{20} = \frac{\square}{25} = \frac{6}{30}$ 無情境

(D) $\frac{\square}{8} = \frac{15}{\square} = \frac{24}{32}$ 無情境

14. Find values that make each sentence correct.

a. $\frac{6}{14} = \frac{\square}{21} = \frac{\square}{28}$

b. $\frac{\square}{27} = \frac{8}{36} = \frac{\square}{63}$

c. $\frac{\square}{20} = \frac{\square}{25} = \frac{6}{30}$

d. $\frac{\square}{8} = \frac{15}{\square} = \frac{24}{32}$

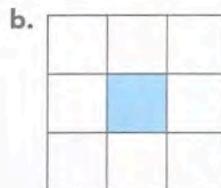
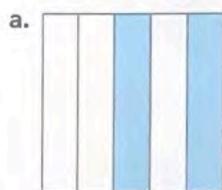
編碼：7(h)-4-2-15(A, B)

對於每個圖表，寫出三個語句來比較陰影區域和非陰影區域的面積。在一個陳述中，使用分數來表達比較。第二個，使用百分比。第三，使用比例。(如下圖)

(A) 無情境

(B) 無情境

15. For each diagram, write three statements comparing the areas of the shaded and unshaded regions. In one statement, use fractions to express the comparison. In the second, use percentages. In the third, use ratios.



編碼：7(h)-4-2-16

(多選) 選擇 $\frac{18}{30} = \frac{\square}{15}$ 正確的值。無情境

F.7

G.8

H.9

J.10

16. **Multiple Choice** Choose the value that makes $\frac{18}{30} = \frac{\square}{15}$ correct.

F. 7

G. 8

H. 9

J. 10

編碼：7(h)-4-2-17

(多選) 選擇 $\frac{\square}{15} \leq \frac{3}{5}$ 正確的值。無情境

- A.9
- B.10
- C.11
- D.12

17. **Multiple Choice** Choose the value that makes $\frac{\square}{15} \leq \frac{3}{5}$ correct.

A. 9

B. 10

C. 11

D. 12

編碼：7(h)-4-2-18

對於練習 18-21，重寫每個方程。將變量替換為能夠做出正確陳述的數字。

$9/4 \times n = 1 \frac{3}{4}$ 無情境

For Exercises 18-21, rewrite each equation. Replace the variable with a number that makes a true statement.

18. $\frac{4}{9} \times n = 1 \frac{1}{3}$

編碼：7(h)-4-2-19

(如編碼：7(h)-4-2-18 之題幹)

$n \times 2.25 = 90$ 無情境

For Exercises 18-21, rewrite each equation. Replace the variable with a number that makes a true statement.

19. $n \times 2.25 = 90$

編碼：7(h)-4-2-20

(如編碼：7(h)-4-2-18 之題幹)

$n \div 15 = 120$ 無情境

For Exercises 18-21, rewrite each equation. Replace the variable with a number that makes a true statement.

20. $n \div 15 = 120$

編碼：7(h)-4-2-21

(如編碼：7(h)-4-2-18 之題幹)

$180 \div n = 15$ 無情境

For Exercises 18-21, rewrite each equation. Replace the variable with a number that makes a true statement.

21. $180 \div n = 15$

編碼：7(h)-4-2-22

找出兩個乘積在 10 到 11 之間的分數。無情境

22. Find two fractions with a product between 10 and 11.

編碼：7(h)-4-2-23

找出乘積在 1 和 2 之間的兩位小數。無情境

23. Find two decimals with a product between 1 and 2.

編碼：7(h)-4-2- 24(A, B, C)

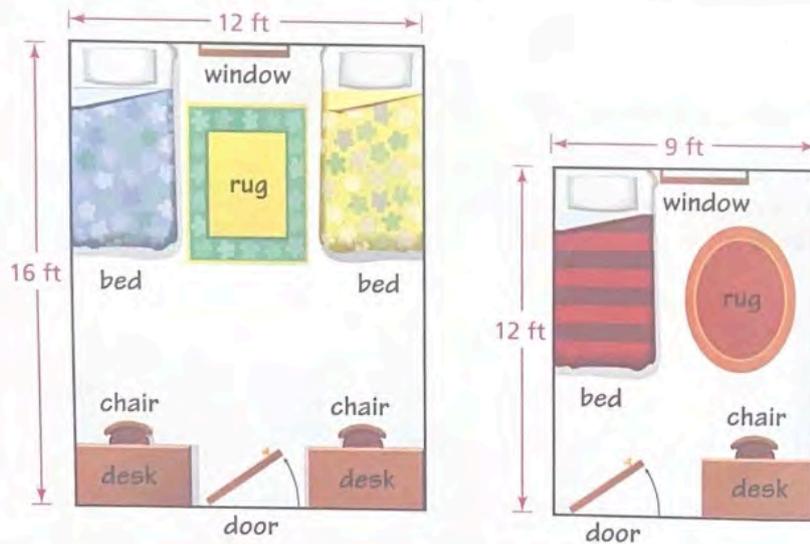
這些圖表顯示了兩個不同宿舍房間的平面圖。一房間可供兩名學生入住。另一個是給一名學生的

(A) 平面圖的牆壁是類似的矩形嗎？如果是這樣，比例因子是多少？如果沒有，為什麼呢？個人情境

(B) 兩個房間的建築面積（包括床下和書桌下的空間）的比例是多少？個人情境

(C) 哪個房間為每個學生提供更多的空間？個人情境

24. These diagrams show floor plans for two different dorm rooms. One room is for two students. The other is for one student.



- Are the walls of the floor plans similar rectangles? If so, what is the scale factor? If not, why not?
- What is the ratio of the floor areas of the two rooms (including the space under the beds and desks)?
- Which room gives more space per student?

編碼：7(h)-4-2-25

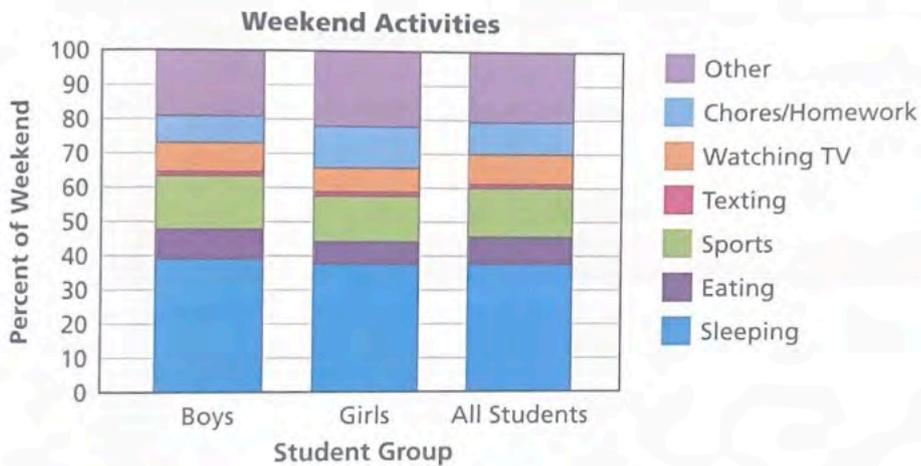
對於練習 25 和 26，請使用下面的表格和圖表。該表顯示了一個七年級班級的學生在周末花在多項活動上的平均時間。數據也顯示在堆積條形圖中。

堆積條形圖是使用表中的數據製作的。解釋它是如何構建的。社會情境

For Exercises 25 and 26, use both the table and the graph below. The table shows the mean times that students in one seventh-grade class spend on several activities during a weekend. The data are also displayed in the stacked bar graph.

Weekend Activities (hours)

Category	Boys	Girls	All Students
Sleeping	18.8	18.2	18.4
Eating	4.0	2.7	3.1
Sports	7.8	6.9	7.2
Texting	0.5	0.7	0.6
Watching TV	4.2	3.0	3.4
Chores and Homework	3.6	5.8	5.1
Other	9.1	10.7	10.2



25. The stacked bar graph was made using the data from the table. Explain how it was constructed.

編碼：7(h)-4-2-26

(如編碼：7(h)-4-2-25 之題幹)

假設您正在編寫一份總結班級數據的報告。您有空間放置表格或圖表，但不能同時放置兩者。包含該表的優點之一是什麼？包含條形圖的優點之一是什麼？**社會情境**

26. Suppose you are writing a report summarizing the class's data. You have space for either the table or the graph, but not both. What is one advantage of including the table? What is one advantage of including the bar graph?

編碼：7(h)-4-2-27(A, B)

一位蔓越莓沼澤的主人已經榨出了 240 升蔓越莓汁。他有多種尺寸的容器來包裝果汁。

(A) 店主希望將所有蔓越莓汁包裝在相同的包裝中容器。複製並填寫表格以顯示數字業主需要包裝的各種尺寸的集裝箱果汁。職業情境

(B) 寫出一個方程式，將容器的體積 V 與容納 240 升酸果蔓汁所需的容器數量 a 聯繫起來。職業情境

27. A cranberry bog owner has pressed 240 liters of cranberry juice. He has many sizes of containers in which to package the juice.

a. The owner wants to package all the cranberry juice in identical containers. Copy and complete the table to show the number of containers of each size the owner would need to package the juice.

Containers Needed by Volume

Volume of Container (liters)	10	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$
Number of Containers Needed	■	■	■	■	■	■	■

b. Write an equation that relates the volume V of a container and the number of containers n needed to hold 240 liters of cranberry juice.

編碼：7(h)-4-2-28(A, B, C)

化學學生分析了鐵鏽的成分。他們發現它是由鐵和氧組成的。對鐵鏽樣品的測試給出了下表中的數據

(A) 每個樣品中鐵與氧的比例是否相同？解釋。科學情境

(B) 鐵與總鏽的比例是每個樣本都一樣嗎？解釋。科學情境

(C) 學生們分析 400 克鐵鏽。需要多少鐵以及如何他們應該找到多少氧氣？
科學情境

28. Chemistry students analyzed the contents of rust. They found that it is made up of iron and oxygen. Tests on samples of rust gave the data in the table below.

Contents of Rust

Amount of Rust (g)	Amount of Iron (g)	Amount of Oxygen (g)
50	35.0	15.0
100	70.0	30.0
135	94.5	40.5
150	105.0	45.0

- Is the ratio of iron to oxygen the same in each sample? Explain.
- Is the ratio of iron to total rust the same in each sample? Explain.
- The students analyze 400 grams of rust. How much iron and how much oxygen should they find?



編碼：7(h)-4-2-29(A, B, C, D)

哺乳動物的懷孕期和妊娠期長短各不相同。妊娠期是指從受孕到出生的時間。使用下表回答下面的問題。

- (A) 對於表中列出的每種哺乳動物，比較壽命與妊娠期。科學情境
- (B) 哪種動物的壽命與妊娠時間的比率最大？哪個比率最小？科學情境
- (C) 使用（妊娠、壽命）作為數據點在坐標圖上繪製數據。描述您看到的任何模式。兩個變量之間有關係嗎？解釋。科學情境
- (D) 如果每個陳述都是正確的，您希望在圖表中看到什麼模式！
- 長妊娠時間意味著更長的壽命。
 - 妊娠時間越長意味著壽命越短。科學情境

29. Mammals vary in the length of their pregnancies, or gestations. Gestation is the time from conception to birth. Use the table to answer the questions below.

**Gestation Times and Life Spans
of Selected Mammals**

Animal	Gestation (days)	Life Span (years)
Chipmunk	31	6
Cat	63	12
Fox	52	7
Lion	100	15
Black Bear	219	18
Gorilla	258	20
Moose	240	12
Giraffe	425	10
Elephant (African)	660	35

SOURCE: *The World Almanac and Book of Facts*

- For each mammal listed in the table, compare life span to gestation.
- Which animal has the greatest ratio of life span to gestation time? Which has the least ratio?
- Plot the data on a coordinate graph using (gestation, life span) as data points. Describe any patterns that you see. Is there a relationship between the two variables? Explain.
- What pattern would you expect to see in a graph if each statement were true?
 - Longer gestation time implies longer life span.
 - Longer gestation time implies shorter life span.

編碼：7(h)-4-3-1

對於練習 1-5，計算銷售稅。

一件毛衣，售價 36.00 美元，含 7% 銷售稅。個人情境

For Exercises 1-5, find the sales tax.

1. a sweater for \$36.00 at 7% sales tax

編碼：7(h)-4-3-2

(如編碼：7(h)-4-3-1 之題幹)

一塊滑板，售價 62.80 美元，需繳納 6% 的銷售稅。個人情境

For Exercises 1-5, find the sales tax.

2. a skateboard for \$62.80 at 6% sales tax

編碼：7(h)-4-3-3

(如編碼：7(h)-4-3-1 之題幹)

一頂棒球帽，售價 22.90 美元，5% 銷售稅。個人情境

For Exercises 1-5, find the sales tax.

3. a baseball hat for \$22.90 at 5% sales tax

編碼：7(h)-4-3-4

(如編碼：7(h)-4-3-1 之題幹)

一台數碼相機，售價 249.99 美元，徵收 4% 的銷售稅。個人情境

For Exercises 1–5, find the sales tax.

4. a digital camera for \$249.99 at 4% sales tax

編碼：7(h)-4-3-5

(如編碼：7(h)-4-3-1 之題幹)

一款棋盤遊戲，售價 29.95 美元，徵收 8% 的銷售稅。個人情境

For Exercises 1–5, find the sales tax.

4. a digital camera for \$249.99 at 4% sales tax

編碼：7(h)-4-3-6

Bennett 買了一頓 21 美元的飯菜。銷售稅為 5%。貝內特試圖通過幾種不同的方式找到銷售稅。他的哪些方法是正確的？正確的方法中，哪種最有意義你？解釋。個人情境

- A. 5% 的銷售稅意味著每一美元你花了，你需要付五分錢稅。如果你花 21 美元買東西，你需要繳納 21 五分鎊幣的稅。
- B. 您可以設置一個比例並求解缺失值。 $\$.05/\$1.00 = x/\$21.00$
- C. 我知道 21.00 美元的 10% 是 2.10 美元，因此 5% 是 2.10 美元的一半。
- D. 5% 等於 $1/20$ 求稅額在 \$21 上，找到 $\$21 \div 20$ 。
- E. 21.00 美元的 1% 是 0.21 美元，因此 21.00 美元的 5% 是 5×0.21 美元。

6. Bennett bought a \$21 meal. The sales tax was 5%. Bennett tried to find the sales tax in a few different ways. Which of his methods are correct? Of the correct methods, which makes the most sense to you? Explain.

- A. 5% sales tax means that for every dollar you spend, you need to pay a nickel in tax. If you buy something for \$21, you need to pay 21 nickels in tax.
- B. You can set up a proportion and solve for the missing value.

$$\frac{\$.05}{\$1.00} = \frac{x}{\$21.00}$$

- C. I know that 10% of \$21.00 is \$2.10, so 5% would be half of \$2.10.
- D. 5% is equal to $\frac{1}{20}$. To find the amount of tax on \$21, find $\$21 \div 20$.
- E. 1% of \$21.00 is \$.21, so 5% of \$21.00 is $5 \times \$.21$.

編碼：7(h)-4-3-7(A, B)

一群朋友在一家餐廳點了披薩。每個人在點餐前都會給克里斯一些錢。

(A) Chris 有 63 美元可用於訂單，其中包括稅費。稅額位於餐廳是 5%。團體的最高食物成本是多少可以訂購但不超過 63 美元嗎？解釋你的推理。個人情境

(B) 克里斯想在食品價格上留下 15% 的小費（按消費稅計算）。團體的最高食物成本是多少訂購且價格不超過 63 美元？解釋。個人情境

7. A group of friends orders pizza at a restaurant. Each person gives some money to Chris before they order.
- Chris has \$63 to spend on the order, including tax. The tax at the restaurant is 5%. What is the maximum cost of food the group can order and not go over \$63? Explain your reasoning.
 - Chris wants to leave a 15% tip on the price of the food, calculated before sales tax. What is the maximum cost of food the group can order and not go over \$63? Explain.

編碼：7(h)-4-3-8

對於練習 8-10，確定哪一個估計最合適合理的。解釋。個人情境

購買 42.00 美元需繳納 5% 稅為

超過 2.00 美元

正好 2.00 美元

2.00 美元以下

For Exercises 8-10, identify which estimate seems the most reasonable. Explain.

8. 5% tax on a \$42.00 purchase

under \$2.00

exactly \$2.00

over \$2.00

編碼：7(h)-4-3-9

(如編碼：7(h)-4-3-8 之題幹)

購買 59.99 美元可繳 9% 稅為？個人情境

超過 6.00 美元

正好 6.00 美元

6.00 美元以下

For Exercises 8-10, identify which estimate seems the most reasonable. Explain.

9. 9% tax on a \$59.99 purchase

under \$6.00

exactly \$6.00

over \$6.00

編碼：7(h)-4-3-10

(如編碼：7(h)-4-3-8 之題幹)

購買 309.95 美元需繳納 5.5% 稅為？個人情境

超過 15.00 美元

正好 15.00 美元

低於 15.00 美元

For Exercises 8-10, identify which estimate seems the most reasonable. Explain.

10. 5.5% tax on a \$309.95 purchase

under \$15.00

exactly \$15.00

over \$15.00

編碼：7(h)-4-3-11

對於練習 11-14，請使用以下信息。

Bill's Bikes 銷售新自行車和二手自行車。比爾購買二手自行車，進行修理，然後將價格提高 80%。銷售自行車的銷售人員獲得 25% 的加價佣金。找出表中缺失的值。職業情境

For Exercises 11–14, use the following information.

Bill's Bikes sells new and used bikes. Bill buys used bikes, fixes them, and marks up the prices by 80%. The salesperson selling the bike gets a 25% commission on the markup.

11. Find the missing values in the table.

Costs and Revenue for Roberto's Sales

Buying Price	Markup (80% of buying price)	Selling Price	Commission (25% of markup)	Profit (money the shop makes on the sale)
\$100	\$80	\$180	\$20	\$60
\$10	■	■	■	■
\$55	■	■	■	■
\$125	■	■	■	■

編碼：7(h)-4-3-12

(如編碼：7(h)-4-3-11 之題幹)

找出表中缺失的值。職業情境

For Exercises 11–14, use the following information.

12. Find the missing values in the table.

Costs and Revenue for Linda's Sales

Buying Price	Markup (80% of buying price)	Selling Price	Commission (25% of markup)	Profit (money the shop makes on the sale)
■	\$48	■	■	■
■	■	\$252	■	■
■	■	■	\$14.40	■
■	■	■	■	\$54
\$N	■	■	■	■

編碼：7(h)-4-3-13

(如編碼：7(h)-4-3-11 之題幹)

對於下圖中的每個箭頭，編寫一條數學規則來描述如何從一個值到下一個值。第一個已經為你完成了。職業情境

For Exercises 11–14, use the following information.

13. For each arrow in the figure below, write a mathematical rule describing how to get from one value to the next value. The first one is done for you.



編碼：7(h)-4-3-14(A, B, C, D)

(如編碼：7(h)-4-3-11 之題幹)

對於每個部分，為列出的關係寫出兩個方程。

(A) 加價金額和購買價格 職業情境

(B) 買入價和賣出價 職業情境

(C) 佣金和加價金額 職業情境

(D) 利潤和佣金 職業情境

For Exercises 11-14, use the following information.

14. For each part, write two equations for the listed relationship.

- a. the markup amount and the buying price
- b. the buying price and the selling price
- c. the commission and the markup amount
- d. the profit and the commission

編碼：7(h)-4-3-15

對於練習 15-18，解決轉換問題。

艾倫在 3 小時內以穩定的速度跑完 8 英里。多久時間他跑 3 英里？**個人情境**

For Exercises 15–18, solve the conversion problem.

- 15.** Allen runs 8 miles in 3 hours at a steady pace. How long does it take him to run 3 miles?

編碼：7(h)-4-3-16

(如編碼：7(h)-4-3-15 之題幹)

Maren 在 24 分鐘內平穩地行走 $\frac{3}{5}$ 英里。她步行 2 英里需要多長時間？個人

情境

For Exercises 15–18, solve the conversion problem.

16. Maren walks $\frac{3}{5}$ mile in 24 minutes at a steady pace. How long does it take her to walk 2 miles?

編碼：7(h)-4-3-17

(如編碼：7(h)-4-3-15 之題幹)

半個牛油果大約含有 160 卡路里熱量。一打牛油果有多少卡路里？**個人情境**

For Exercises 15–18, solve the conversion problem.

17. Half an avocado has about 160 Calories. How many Calories do a dozen avocados have?

編碼：7(h)-4-3-18

(如編碼：7(h)-4-3-15 之題幹)

湯匙鷹嘴豆泥中大約含有 1.5 克脂肪。2 $\frac{1}{2}$ 杯鷹嘴豆泥中有多少克脂肪？

(注：16 湯匙=1 杯) 個人情境

For Exercises 15–18, solve the conversion problem.

18. There are about 1.5 grams of fat in 1 tablespoon of hummus.
How many grams of fat are in 2 $\frac{1}{2}$ cups of hummus?
(Note: 16 tablespoons = 1 cup)

編碼：7(h)-4-3-19

美國使用英制測量系統。英語系統有許多很少使用的舊轉換。
使用測量轉換完成下表。社會情境

19. The United States uses the English system of measurement. The English system has many old conversions that are rarely used.

English System Measurement Conversions

1 foot = 12 inches	1 furlong = 220 yards	1 rod = 5.5 yards
1 yard = 3 feet	1 furlong = 10 chains	1 yard = 16 nails
1 mile = 5,280 feet	1 furlong = 1,000 links	1 foot = 4 palms
1 mile = 1,760 yards	1 furlong = 40 rods	1 foot = 3 hands

Use the measurement conversions to complete the table below.

Time Predictions

	Distance and Time	Prediction
a.	1,584 feet in 3 minutes	1 mile in ■
b.	2 furlongs in 10 minutes	1 mile in ■
c.	1,500 links in 12 minutes	1 mile in ■
d.	4 rods in 11 seconds	1 mile in ■
e.	5 chains in 1 minute	1 mile in ■

編碼：7(h)-4-3-20

對於練習 20-22，描述 x 代表什麼值。然後求解 x 。

$$\frac{16 \text{ ounces}}{1 \text{ pound}} = \frac{x}{3\frac{1}{3} \text{ pounds}} \quad \text{無情境}$$

For Exercises 20–22, describe what value x represents. Then solve for x .

20. $\frac{16 \text{ ounces}}{1 \text{ pound}} = \frac{x}{3\frac{1}{2} \text{ pounds}}$

編碼：7(h)-4-3-21

(如編碼：7(h)-4-3-20 之題幹)

$$\frac{1\text{gallon}}{16\text{cups}} = \frac{x}{36\text{cups}} \quad \text{無情境}$$

$$21. \frac{1 \text{ gallon}}{16 \text{ cups}} = \frac{x}{36 \text{ cups}}$$

編碼：7(h)-4-3-22

(如編碼：7(h)-4-3-20 之題幹)

$$\frac{x}{12.5 \text{ cups}} = \frac{8 \text{ fluid ounces}}{1 \text{ cup}} \quad \text{無情境}$$

$$22. \frac{x}{12.5 \text{ cups}} = \frac{8 \text{ fluid ounces}}{1 \text{ cup}}$$

編碼：7(h)-4-3-23

對於練習 23-25，請使用問題 3.2 中的轉換錶。寫出比例並解決換算問題。

10 磅等於多少盎司？無情境

For Exercises 23–25, use the conversions chart in Problem 3.2. Write a proportion and solve the conversion problem.

23. How many ounces are in $10\frac{1}{2}$ pounds?

編碼：7(h)-4-3-24

(如編碼：7(h)-4-3-23 之題幹)

加侖有多少杯？無情境

24. How many cups are in 55 gallons?

編碼：7(h)-4-3-25

(如編碼：7(h)-4-3-23 之題幹)

60 公斤大約等於多少磅？無情境

25. About how many pounds are in 60 kilograms?

編碼：7(h)-4-3-26(A, B)

(A) 艾麗西亞、布蘭登和夏琳想要解這個比例 $\frac{x}{4.24} = \frac{6.82}{2.2}$ ，哪位學生使用了

正確的方法？**個人情境**

Alicia：

首先，我簡化了右邊的分數。 $\frac{x}{4.24} = 3.1$ 。然後，我用 4.24 乘以 3.1 來找到

x 。

Charlene：我計算出 $6.82 - 2.2 = 4.62$ 。因此，右邊分數的分子比分母多 4.62。這意味著 $x = 4.24 + 4.62$ ，即 8.86

Brandon：我把所有數值乘以 100 來消除小數。 $\frac{100x}{4.24} = \frac{682}{220}$ 。然後我將兩邊同

時乘以 4.24。 $100x = \frac{682 \times 4.24}{220}$ 。我簡化了右邊的分數。 $100x = 1314.4$

然後我將兩邊同時除以 100。 $x = \frac{1314.4}{100}$

(B) 在正確的方法中，哪一種對您最有意義？解釋。**個人情境**

26. a. Alicia, Brandon, and Charlene wanted to solve the proportion $\frac{x}{4.24} = \frac{6.82}{2.2}$. Which of the students used a correct method?

Alicia

First, I simplified the fraction on the right.

$$\frac{x}{4.24} = 3.1$$

Then, I multiplied 3.1 by 4.24 to find x .

Charlene

I figured out that $6.82 - 2.2 = 4.62$. So, the numerator in the right fraction was 4.62 greater than the denominator. This means that $x = 4.24 + 4.62$, or 8.86.

Brandon

I multiplied all the values by 100 to eliminate the decimals.

$$\frac{100x}{4.24} = \frac{682}{220}$$

Then I multiplied both sides by 4.24.

$$100x = \frac{682 \cdot 4.24}{220}$$

I simplified the fraction on the right.

$$100x = 1,314.4$$

Then I divided both sides by 100.

$$x = \frac{1,314.4}{100}$$

b. Of the correct methods, which makes the most sense to you? Explain.

編碼：7(h)-4-3-27

對於練習 27-30，找出黑猩猩食物組合的單位比例。將單位比率視為每 1 勺高蛋白質食物中高纖維食物的勺數。

75%高纖維黑猩猩食物比 25%高蛋白質黑猩猩食物。個人情境

For Exercises 27–30, find the unit rate for the chimp food mix.
Consider the unit rate to be the number of scoops of high-fiber food per 1 scoop of high-protein food.

27. 75% high-fiber chimp food to 25% high-protein chimp food

編碼：7(h)-4-3-28

(如編碼：7(h)-4-3-27 之題幹)

80%高纖維黑猩猩食物比 20%高蛋白黑猩猩食物。個人情境

28. 80% high-fiber chimp food to 20% high-protein chimp food

編碼：7(h)-4-3-29

(如編碼：7(h)-4-3-27 之題幹)

85%高纖維黑猩猩食物比 15%高蛋白黑猩猩食物。個人情境

29. 85% high-fiber chimp food to 15% high-protein chimp food

編碼：7(h)-4-3-30

(如編碼：7(h)-4-3-27 之題幹)

95%高纖維黑猩猩食物比 5%高蛋白黑猩猩食物。個人情境

30. 95% high-fiber chimp food to 5% high-protein chimp food

編碼：7(h)-4-3-31

對於練習 31-33，找出黑猩猩食物混合物中高纖維的百分比和高蛋白混合物的百分比。注：單位比例為每份高纖維食物的勺數一勺高蛋白食物。

單位費率:1 個人情境

For Exercises 31–33, find the percentage of the chimp food mix that is high fiber and the percentage of the mix that is high protein.
Note: The unit rate is the number of scoops of high-fiber food per one scoop of high-protein food.

31. unit rate: 1

編碼：7(h)-4-3-32

(如編碼：7(h)-4-3-31 之題幹)

單位費率:1/3 個人情境

For Exercises 31–33, find the percentage of the chimp food mix that is high fiber and the percentage of the mix that is high protein.

Note: The unit rate is the number of scoops of high-fiber food per one scoop of high-protein food.

32. unit rate: $\frac{1}{3}$

編碼：7(h)-4-3-33

(如編碼：7(h)-4-3-31 之題幹)

單位費率:9 個人情境

For Exercises 31–33, find the percentage of the chimp food mix that is high fiber and the percentage of the mix that is high protein.

Note: The unit rate is the number of scoops of high-fiber food per one scoop of high-protein food.

33. unit rate: 9

編碼：7(h)-4-3-34(A, B)

Lealani 有 24 勺高纖維黑猩猩食物。

(A) 如果 Lealani 想給黑猩猩寶寶餵食，她應該添加多少勺高蛋白食物？回想一下，小黑猩猩需要 40% 的高纖維食物和 60% 的高蛋白食物。個人情境

(B) 如果萊拉尼想給成年黑猩猩提供高蛋白食物，她應該在混合物中添加多少勺高蛋白食物？回想一下，成年黑猩猩需要 60% 的高纖維食物和 40% 的高蛋白食物。個人情境

34. Lealani has 24 scoops of high-fiber chimp food.

- a. How many scoops of high-protein food should Lealani add to the mix if she wants to give it to baby chimps? Recall that baby chimps need 40% high-fiber food and 60% high-protein food.
- b. How many scoops of high-protein food should Lealani add to the mix if she wants to give it to adult chimps? Recall that adult chimps need 60% high-fiber food and 40% high-protein food.



Grown chimpanzees are about 4 feet tall. You can use that information to estimate the height of this baby chimp.

編碼：7(h)-4-3-35

Claire 和 Pam 考慮以下兩種情況。

將價格提高 25% 並獲得 10% 的佣金

將價格提高 10% 並獲得 25% 佣金

標記這些情況會產生相同的佣金，還是其中一項佣金會更高？如果其中一項佣金更高，哪一項佣金更高？職業情境

35. Claire and Pam consider the two situations below.

- marking up the price 25% and getting a 10% commission on the markup
- marking up the price 10% and getting a 25% commission on the markup

Will these situations result in the same commission, or will one commission be greater? If one commission is greater, which one?

編碼：7(h)-4-3-36

艾琳發現一件售價 21 美元的襯衫需要繳納 5% 的銷售稅。她將稅額計算為 $0.05 \times 21 = 1.05$ ，即 1.05 美元。艾琳注意到她可以添加 $21 + 1.05 = 22.05$ 來找到總成本 22.05 美元。她利用分配律寫成 $(1 \times 21) + (0.05 \times 21) = 1.05 \times 21$ 。對於下面的每一項，將該項的總成本寫為兩個數字。個人情境

36. Erin finds 5% sales tax for a shirt that costs \$21. She calculates the tax as $0.05 \times 21 = 1.05$, or \$1.05.

Erin notices that she can add $21 + 1.05 = 22.05$ to find the total cost, \$22.05. She uses the Distributive Property to write $(1 \times 21) + (0.05 \times 21) = 1.05 \times 21$.

For each item below, write the total cost of the item as the product of two numbers.

Item Name	Price	Tax Rate	Tax
shirt	\$21.00	5%	1.05×21
a. bicycle	\$45.90	7%	
b. shoes	\$67.50	6%	
c. laptop	\$299.99	8%	
d. video game	\$39.95	4%	

Credit	Debit	Subtotal	\$474.34
Check	Cash	Tax	
Print Receipt		Order total	
		Cash	

編碼：7(h)-4-3-37

在練習 36 中，您使用分配率來計算產品和銷售稅的總成本。您還可以使用分配屬性來查找折扣後的總成本。假設一件原價 21 美元的襯衫有 5% 的折扣。編寫一個表達式，將襯衫的折扣價格顯示為兩個數字的乘積。解釋你的推理。個人情境

37. In Exercise 36, you used the Distributive Property to find the total cost of a product and sales tax. You can also use the Distributive Property to find the total cost after a discount.

Suppose there is a 5% discount on a shirt that was originally priced at \$21. Write an expression that shows the discounted price of the shirt as the product of two numbers. Explain your reasoning.

編碼：7(h)-4-3-38(A, B)

比爾的自行車店進行促銷活動，自行車店向顧客支付稅款。根據法律規定，比爾必須徵收 6% 的銷售稅，因此他找到了一種不同的方法來將稅款從帳單中扣除。比爾決定給每個顧客 6% 的折扣。

(A) 客戶支付折扣價加稅。這個金額會和原價一樣嗎？解釋你的推理。職業情境

(B) 先應用折扣還是先應用稅收有關係嗎？解釋。職業情境

38. Bill's bike shop has a sale where the bike shop pays the customer's tax. By law, Bill has to charge a 6% sales tax, so he finds a different way to take the tax off the bill. Bill decides to give each customer a 6% discount.

- a. The customer pays the discounted price plus tax. Will this amount be the same as the original price? Explain your reasoning.
- b. Does it matter which is applied first, the discount or the tax? Explain.

編碼：7(h)-4-3-39

(多選) 對於練習 39-44，選擇最佳估計分工問題。解釋你的推理。無情境

$$1\frac{2}{5} \div \frac{3}{4}$$

- A. 少於 1
- B. 在 1、2 之間
- C. 在 2、3 之間
- D. 大於 3

Multiple Choice For Exercises 39–44, choose the best estimate for the division problem. Explain your reasoning.

39. $1\frac{2}{5} \div \frac{3}{4}$

- A. less than 1 B. between 1 and 2 C. between 2 and 3 D. greater than 3

編碼：7(h)-4-3-40

(如編碼：7(h)-4-3-39 之題幹)

$$10 \div 1\frac{7}{8}$$

- A. 少於 1
- B. 在 1、5 之間
- C. 在 5、10 之間
- D. 大於 10

Multiple Choice For Exercises 39–44, choose the best estimate for the division problem. Explain your reasoning.

40. $10 \div 1\frac{7}{8}$

- F. less than 1 G. between 1 and 5 H. between 5 and 10 J. greater than 10

編碼：7(h)-4-3-41

(如編碼：7(h)-4-3-39 之題幹)

$$5 \frac{9}{10} \div 1 \frac{1}{2} \text{ 無情境}$$

- A. 少於 1
- B. 在 1、4 之間
- C. 在 4、12 之間
- D. 大於 12

Multiple Choice For Exercises 39–44, choose the best estimate for the division problem. Explain your reasoning.

41. $5 \frac{9}{10} \div 1 \frac{1}{2}$

- A. less than 1 B. between 1 and 4 C. between 4 and 12 D. greater than 12

編碼：7(h)-4-3-42

(如編碼：7(h)-4-3-39 之題幹)

$14\frac{2}{7} \div \frac{8}{10}$ 無情境

- A. 少於 1
- B. 在 1、7 之間
- C. 在 7、14 之間
- D. 大於 14

Multiple Choice For Exercises 39–44, choose the best estimate for the division problem. Explain your reasoning.

42. $14\frac{2}{7} \div \frac{8}{10}$

- F. less than 1 G. between 1 and 7 H. between 7 and 14 J. greater than 14

編碼：7(h)-4-3-43

(如編碼：7(h)-4-3-39 之題幹)

$$\frac{3}{4} \div \frac{7}{8} \quad \text{無情境}$$

- A. 少於 1
- B. 在 1、2 之間
- C. 在 2、8 之間
- D. 大於 8

Multiple Choice For Exercises 39–44, choose the best estimate for the division problem. Explain your reasoning.

43. $\frac{3}{4} \div \frac{7}{8}$

- A. less than 1 B. between 1 and 2 C. between 2 and 8 D. greater than 8

編碼：7(h)-4-3-44

(如編碼：7(h)-4-3-39 之題幹)

$$\frac{19}{20} \div \frac{6}{10} \quad \text{無情境}$$

- A. 少於 1
- B. 在 1、2 之間
- C. 在 2、10 之間
- D. 大於 10

Multiple Choice For Exercises 39–44, choose the best estimate for the division problem. Explain your reasoning.

44. $\frac{19}{20} \div \frac{6}{10}$

- F.** less than 1 **G.** between 1 and 2 **H.** between 2 and 10 **J.** greater than 10

編碼：7(h)-4-3-45(A, B, C)

Felipe 在 45 分鐘內以恆定速度步行 2 又 $\frac{1}{4}$ 英里。使用下面的模型回答有關 Felipe 步行多遠的問題

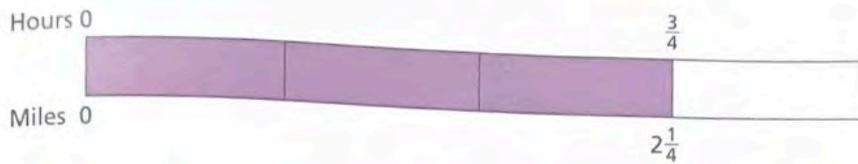
(A) Felipe 在 15 分鐘內步行多遠？Felipe 步行 4 英里需要多長時間？**個人情境**

(B) Felipe 在 1 小時內走了多遠？**個人情境**

(C) Felipe 步行 $4\frac{1}{2}$ 英里需要多長時間？**個人情境**

(D) Felipe 步行 $3\frac{1}{4}$ 英里需要多長時間？**個人情境**

45. Felipe walks $2\frac{1}{4}$ miles in 45 minutes at a constant rate. Use the model below to answer the questions about how far Felipe walks.



- How far does Felipe walk in 15 minutes?
- How far does Felipe walk in 1 hour?
- How long does it take Felipe to walk $4\frac{1}{2}$ miles?
- How long does it take for Felipe to walk $3\frac{1}{4}$ miles?

編碼：7(h)-4-3-46

對於練習 46-49，解出每個比例。無情境

For Exercises 46–49, solve each proportion.

46. $\frac{\frac{4}{5}}{\frac{1}{5}} = \frac{x}{1\frac{1}{2}}$

編碼：7(h)-4-3-47

(如編碼：7(h)-4-3-46 隻題幹) 無情境

47. $\frac{5}{3} \div \frac{6}{5} = \frac{x}{\frac{4}{9}}$

編碼：7(h)-4-3-48

(如編碼：7(h)-4-3-46 隻題幹) 無情境

48. $\frac{\frac{6}{5}}{\frac{6}{10}} = \frac{x}{1\frac{2}{10}}$

編碼：7(h)-4-3-49

(如編碼：7(h)-4-3-46 隻題幹) 無情境

49. $\frac{2}{\frac{1}{3}} = \frac{x}{\frac{5}{6}}$

編碼：7(h)-4-3-50(A, B,C)

下表顯示了升和夸脫之間的換算

(A) 5.5 夸脫大約有多少升？無情境

(B) 5.5 升大約有多少夸脫？寫出一個將升 L 與夸脫 Q 。無情境

(C) 寫出方程式比較升 L 與夸脫 Q 。無情境

50. The table below shows the conversion between liters and quarts.

Conversion Table

Liters	Quarts
1	1.06
4	4.24
5	5.30
9	9.54

- About how many liters are in 5.5 quarts?
- About how many quarts are in 5.5 liters?
- Write an equation that relates liters L to quarts Q .

編碼：7(h)-4-3-51(A, B, C, D, E)

練習 51-53 是關於為不同靈長類動物混合食物的方法動物園。

皮拉爾混合靈長類動物的食物。對於猩猩，她使用下表中的信息。

- (A) 高蛋白食物與高纖維食物的比例是多少？**職業情境**
- (B) 寫出一個高蛋白食物勺數與高纖維食物勺數關係的方程。**職業情境**
- (C) 如果 Pilar 混合 12 勺高蛋白食物，則需要添加多少勺高纖維食物嗎？**職業情境**
- (D) 每 1 勺高蛋白食物，Pilar 需要多少勺高纖維食物？**職業情境**
- (E) 繪製圖表，y 軸為高蛋白食物含量 x 軸表示高纖維食物的含量。**職業情境**

Exercises 51-53 are about ways to mix food for different primates at the zoo.

51. Pilar mixes the primate food. For the orangutans, she uses the information in the table below.

Orangutan Food Mix

Scoops of High-Protein Food	21	24	27	18	33
Scoops of High-Fiber Food	7	8	9	6	11

- What is the ratio of high-protein food to high-fiber food?
- Write an equation that relates the number of scoops of high-protein food to the number of scoops of high-fiber food.
- If Pilar mixes 12 scoops of high-protein food, how many scoops of high-fiber food should she add?
- For every 1 scoop of high-protein food, how many scoops of high-fiber food does Pilar need?
- Draw a graph with the amounts of high-protein food on the y-axis and the amounts of high-fiber food on the x-axis.

編碼：7(h)-4-3-52(A, B, C, D)

小猩猩高纖維食物與高蛋白食物的比例為 30% 到 70%。

- (A) 該混合物的單位比率是多少？職業情境
- (B) 複製並填寫下表。職業情境
- (C) 繪製小猩猩高蛋白食物與高纖維食物的關係圖。職業情境
- (D) 寫出一個方程式，將高蛋白食物的勺數與高纖維食物的勺數聯繫起來。職業情境

52. The ratio of high-fiber food to high-protein food for baby gorillas is 30% to 70%.

- a. What is the unit rate for this mixture?
- b. Copy and complete the table below.

Baby Gorilla Food Mix

Scoops of High-Protein Food	■	14	1	■	x
Scoops of High-Fiber Food	3	■	■	1	■

- c. Graph the relationship of high-protein food to high-fiber food for baby gorillas.
- d. Write an equation relating the number of scoops of high-protein food to the number of scoops of high-fiber food.

編碼：7(h)-4-3-53(A, B, C, D)

Pilar 得到以下關於動物園成人狒狒食物混合比例的圖表。

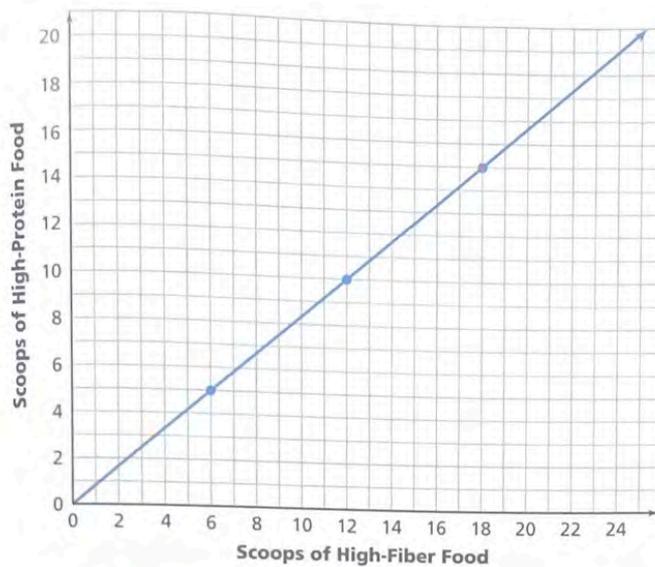
(A) 如果使用 5 勺高纖維食物，Pilar 應該使用多少勺高蛋白食物？請估計一個合理的數量。職業情境

(B) Pilar 希望記住一個由小整數組成的高蛋白食物和高纖維食物的比例。她應該記住什麼比例？

(C) 寫出一個能代表上述圖表的方程。職業情境

(D) Pilar 在混合物中使用 54 勺高蛋白食物。她應該使用多少勺高纖維食物？職業情境

53. Pilar was given the following graph of the mix ratio for adult baboon food at the zoo.



- What is a good estimate for the number of scoops of high-protein food Pilar should use with 5 scoops of high-fiber food?
- Pilar wants to remember a ratio of high-protein food to high-fiber food that uses small whole numbers. What ratio should she remember?
- Write an equation that represents the graph above.
- Pilar uses 45 scoops of high-protein food in a mix. How many scoops of high-fiber food should she use?

編碼：7(h)-4-3-54(A, B, C, D)

斯巴坦維爾市運營兩個夏令營，分別是綠色中心和藍色中心。右側的表格顯示了這兩個夏令營最近的參加人數。

(A) 使用差異來比較兩個中心的男孩和女孩夏令營項目。哪個中心似乎提供了更吸引女孩的項目？社會情境

(B) 使用分數來比較兩個中心的男孩和女孩夏令營項目。哪個中心看起來提供了更吸引女孩的項目？社會情境

(C) 使用百分比來比較兩個中心的男孩和女孩夏令營項目。哪個中心看起來提供了更吸引女孩的項目？社會情境

(D) 使用比例來比較兩個中心的男孩和女孩夏令營項目。哪個中心看起來提供了更吸引女孩的項目？社會情境

54. The city of Spartanville runs two summer camps, the Green Center and the Blue Center. The table at the right shows recent attendance at the two camps.

	Green	Blue
Boys	125	70
Girls	75	30

- Use differences to compare the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?
- Use fractions to compare the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?
- Use percents to compare the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?
- Use ratios to compare the appeal of the two centers' camp programs for boys and girls. Which center seems to offer a program that appeals more to girls?

編碼：7(h)-4-3-55(A, B, C1, C2)

使用右側的表格

(A) 在哪項運動中，男孩的數量遠超女孩？社會情境

(B) 在哪項運動中，女孩的數量遠超男孩？社會情境

這些團隊運動的參與人數在 Key 中學的學生中大致相同。

(C1) 假設 Key 中學有 250 名男孩參加運動。你預計這 250 名男孩中每項運動分別有多少人參加？社會情境

(C2) 假設 Key 中學有 240 名女孩參加運動。你預計這 240 名女孩中每項運動分別有多少人參加？社會情境

55. Use the table at the right.

a. In which sport do boys most outnumber girls?

b. In which sport do girls most outnumber boys?

c. The participation in these team sports is about the same for students at Key Middle School.

i. Suppose 250 boys at Key play sports. How many boys would you expect to play each of the three sports?

ii. Suppose 240 girls at Key play sports. How many girls would you expect to play each of the three sports?

Participation in Team Sports at Springbrook Middle School

Sport	Girls	Boys
Basketball	30	80
Football	10	60
Soccer	120	85
Total surveyed	160	225