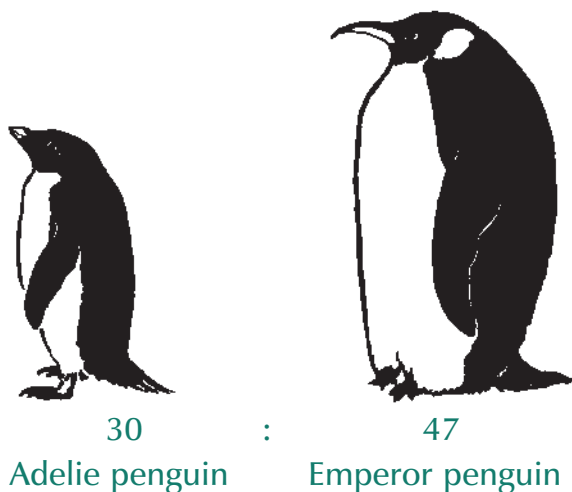




Ratios Compare Measurements

We have used ratios to compare two different amounts. We can also use ratios to compare two different measurements.

The Adelie penguin is 30 inches tall.
The Emperor penguin is 47 inches tall.



The ratio of the Adelie penguin's height to the Emperor penguin's height is 30 to 47.



width = 2"

length = 6"

6 : 2
length to width

The ratio of the length of the rectangle to the width of the rectangle is 6 to 2.

Ratios show us how large the difference is between two different measurements.

Write the ratios.

1. Tim caught 4 ice fish and 3 plunder fish.

What was the ratio of ice fish to plunder fish? _____

2. Greg is 72 inches tall and Tim is 67 inches tall. What is the ratio of Greg's height to Tim's height? _____
3. It took Karen 90 minutes to do her laundry, but it took Sally only 70 minutes to do hers. What was the ratio of the time it took Sally to the time it took Karen?



We Remember

Round to the nearest ten to estimate.

4. On one of the islands off the coast, the scientists saw many seals. They counted 21 southern elephant seals, 9 Ross seals, 39 Antarctic fur seals, 5 leopard seals, 14 crabeater seals, and 54 Weddell seals. How many seals did they count?

_____ + _____ + _____ + _____ + _____ + _____ = _____ seals



5. If the scientists saw $\frac{1}{3}$ of the southern elephant seals on land, how many seals were on the land?

My Work Space

Write a number sentence to find the volume.

6. The scientists at McMurdo Station ordered a fish tank 2 meters long by 1 meter wide by 1 meter high. What volume of water did it hold?

Answer the questions.

7. To call the scientists to meals, Cook Tommy bangs on a metal triangle that is 1 foot long on each side. What is the perimeter of this unusual dinner bell?

Draw a picture if you need help. _____

8. Several penguins swam in a circle that measured 7 ft in diameter. About how many feet was the circumference of the circle? _____

Lesson 7

Mental Math . . . ?

9. a. $53 - 7 =$ _____

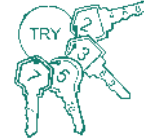
b. $75 - 8 =$ _____

c. $48 - 9 =$ _____

10. a. $16 + 8 =$ _____

b. $36 + 19 =$ _____

c. $15 + 46 =$ _____



Write the fractions in simplest form.

11. a. $\frac{8}{12} =$ _____

b. $\frac{36}{54} =$ _____

c. $\frac{45}{50} =$ _____

d. $\frac{16}{32} =$ _____

Write $<$ or $>$.

12. a. 16.8 _____ 14.9

b. 0.98 _____ 0.89

Sharks may have as many as 3,000 teeth at one time. These teeth are arranged in up to twenty rows.

Skill Builders $+$ $-$ $\times$

Write all fraction answers in simplest form.

Write remainders as fractions.

13. a. $\frac{4}{8} + \frac{5}{8} =$ _____

b. $\frac{8}{12} + \frac{6}{12} =$ _____

c. $\$21.99 - 19.95 =$ _____

d. $\frac{8}{12} + \frac{4}{12} =$ _____

e. $53.2 + 8.7 + 5.2 + 0.8 + 3.7 =$ _____

14. a. $\$0.57 \times 66 =$ _____

b. $68 \times 24 =$ _____

c. $5 \overline{)87} =$ _____

d. $7 \overline{)98} =$ _____

e. $6 \overline{)569} =$ _____

- 15.** Greg and Tim watched an emperor penguin slide down a 13-meter-high ice shelf into the sea. The bird then dived 280 meters deep into the water to catch a fish. How far below her starting point was the penguin when she caught the fish?

If you are not sure how to find the answer, draw a picture of the hill, the sea, and the deep dive. Label the hill and the dive with the correct numbers. Then solve the problem.

My Work Space

- 16.** The emperor penguin dived under the water at 10:13 a.m. and came up again at 10:32 a.m. How long was she under water?

_____ minutes



Sally recorded the temperature regularly for a week. Continue the pattern to find out when she recorded the temperature each day.

17. 6:00 a.m. 10:00 a.m. 2:00 p.m. _____

Count by 12's to 144.

18. _____

Write the missing numerators.

19. a. $\frac{3}{5} = \frac{\quad}{10}$

b. $\frac{2}{7} = \frac{\quad}{21}$

c. $\frac{1}{2} = \frac{\quad}{14}$

d. $\frac{2}{3} = \frac{\quad}{18}$

Write these numbers.

20. Six and two-tenths (decimal) _____

21. Fifty-two hundredths (fraction) _____

22. Forty-two million, six thousand, eight hundred _____

23. Nine hundred million, six hundred forty-two thousand, eight hundred thirty

24. Five-twelfths _____



Multiply 12 Facts

Many things come by twelves. You might buy a dozen eggs or a dozen donuts. So it is good to learn to multiply by 12. The answers to these facts are the same as counting by 12.

$\begin{array}{r} 12 \\ \times 1 \\ \hline 12 \end{array}$	$\begin{array}{r} 12 \\ \times 2 \\ \hline 24 \end{array}$	$\begin{array}{r} 12 \\ \times 3 \\ \hline 36 \end{array}$	$\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$	$\begin{array}{r} 12 \\ \times 5 \\ \hline 60 \end{array}$	$\begin{array}{r} 12 \\ \times 6 \\ \hline 72 \end{array}$	$\begin{array}{r} 12 \\ \times 7 \\ \hline 84 \end{array}$	$\begin{array}{r} 12 \\ \times 8 \\ \hline 96 \end{array}$	$\begin{array}{r} 12 \\ \times 9 \\ \hline 108 \end{array}$	$\begin{array}{r} 12 \\ \times 10 \\ \hline 120 \end{array}$	$\begin{array}{r} 12 \\ \times 11 \\ \hline 132 \end{array}$	$\begin{array}{r} 12 \\ \times 12 \\ \hline 144 \end{array}$
--	--	--	--	--	--	--	--	---	--	--	--

△ **Recite the Multiply 12 facts to someone.**

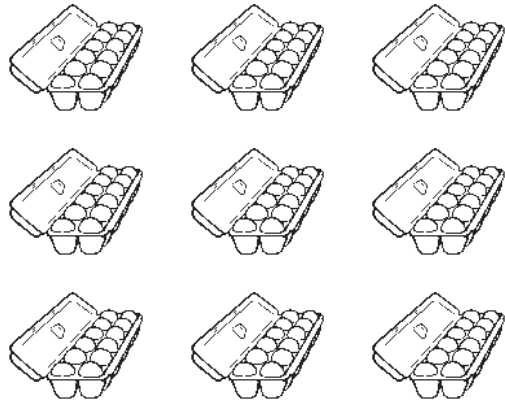
1. I got them all correct. ☐ Yes ☐ No

Gross

A gross is a dozen dozens.

1 gross = 12 dozen objects

1 gross = 144 objects



2. The last plane into McMurdo brought 9 gross of pencils. How many pencils was that?

My Work Space

Using Digit Sums to Check Addition

Note to teacher: This lesson on checking with digit sums is optional and will not be tested. When students are required to check their addition after this, they may use this method or the method they learned previously.

Follow the steps to check addition using digit sums. Circle or box each digit sum to help you keep track of it.

Step 1

Cross out the numbers that equal 9, then find the digit sum of each addend.

Step 2

Add those digit sums (2, 7, 4) to find one digit sum for all the addends.

Step 3

Find the digit sum of the sum.

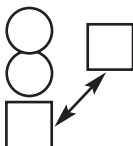
(~~8~~ + ~~6~~ + 6 + 1 + ~~8~~ + 6 = 13; 1 + 3 = 4)

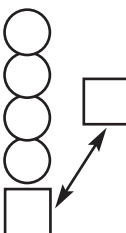
Step 4

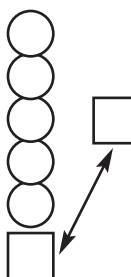
Compare the digit sums. (4 = 4) If the digit sums are the same, your answer is probably right. If the digit sums are different, either your answer is wrong, or you did not check right.

$$\begin{array}{r}
 86,618 \text{ (2)} \\
 4,597 \text{ (7)} \\
 + 504,931 \text{ (4)} \\
 \hline
 596,146 \text{ (4)}
 \end{array}
 \left. \begin{array}{l} \text{ } \\ \text{ } \\ \text{ } \end{array} \right\} \boxed{4}$$

Add. Then use digit sums to check.

3. a.
$$\begin{array}{r}
 873.95 \\
 + 410.62 \\
 \hline
 \end{array}$$


b.
$$\begin{array}{r}
 \$96.51 \\
 12.98 \\
 4.52 \\
 + 3.78 \\
 \hline
 \end{array}$$


c.
$$\begin{array}{r}
 8.1 \\
 4.7 \\
 0.3 \\
 6.9 \\
 + 2.5 \\
 \hline
 \end{array}$$




We Remember

Change these mixed numbers to improper fractions.

4. a. $2\frac{1}{6} = \underline{\hspace{2cm}}$

b. $4\frac{3}{8} = \underline{\hspace{2cm}}$

c. $7\frac{1}{2} = \underline{\hspace{2cm}}$

d. $5\frac{3}{4} = \underline{\hspace{2cm}}$

Skill Builders $+$ $-$ $\times$ $\div$

Write fraction answers in simplest form.

5. a.
$$\begin{array}{r} \frac{3}{4} \\ \frac{3}{4} \\ + \frac{2}{4} \\ \hline \end{array}$$

b.
$$\begin{array}{r} \frac{5}{10} \\ \frac{1}{10} \\ + \frac{2}{10} \\ \hline \end{array}$$

c.
$$\begin{array}{r} \frac{5}{16} \\ \frac{4}{16} \\ + \frac{4}{16} \\ \hline \end{array}$$

d.
$$\begin{array}{r} \$37.59 \\ - 6.92 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 87 \\ \times 60 \\ \hline \end{array}$$

6. a.
$$8 \overline{)329}$$

b.
$$3 \overline{)235}$$

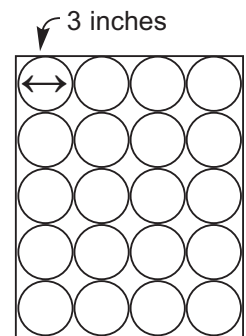
c.
$$6 \overline{)39}$$

d.
$$3 \overline{)87}$$

e.
$$\begin{array}{r} 496 \\ \times 6 \\ \hline \end{array}$$



7. Sally cut cylinder-shaped samples of ice, called cores, for her scientific studies. Each core has a diameter of 3 inches. If the tray can hold 4 samples across, how wide does it have to be? Use the picture to help you answer the questions.

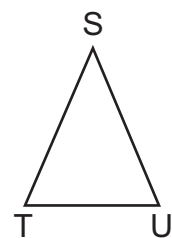
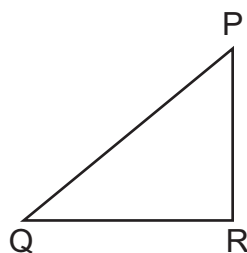


- _____ in
- How long must a tray be to hold a row of 5 core samples?
_____ in
- Now use the work space to find the area of the tray. The tray has an area of _____ in².
- How many core samples can the tray hold?
_____ samples

My Work Space

Name the triangles.

8. _____



Write the ratios.

9. Noah's ark measured 300 cubits long, 50 cubits wide, and 30 cubits high. What was the ratio of length to width? _____

10. What was the ratio of width to height? _____

11. Karen measured the saltiness of the water in the Ross Sea. She collected 50 mL of seawater on Wednesday, 500 mL on Thursday, and 750 mL on Friday. How many mL of seawater did Karen collect?

My Work Space



12. Karen needed only 1,200 mL of the seawater she collected, so she dumped the rest back into the sea. How much water did Karen dump?

My Work Space

Use the pictograph on page iv to answer these questions.

13. How many flying birds did Sally see? _____

14. How many whales? _____

15. What is the ratio of whales to birds? _____

Tell how many.

16. 12 feet = _____ yards

17. 18 feet = _____ yards

The only temperature that is the same in both Fahrenheit and Celsius is forty degrees below zero.