Mixed Measures

Essential Question How can you solve problems involving mixed measures?

Unlock the Problem · Real World

Herman is building a picnic table for a new campground. The picnic table is 5 feet 10 inches long. How long is the picnic table in inches?

🔑 **Change a mixed measure.**

Think of 5 feet 10 inches as 5 feet + 10 inches.

Write feet as inches.

$$\begin{array}{r} 5 \text{ feet} \\ + 10 \text{ inches} \\ \hline \end{array}$$

Think: 5 feet × 12 = 60 inches → ☐ inches
+ ☐ inches
☐ inches

So, the picnic table is _____ inches long.

- Is the mixed measure greater than or less than 6 feet?

  _____

- How many inches are in 1 foot?

  _____

🔑 Example 1 Add mixed measures.

Herman built the picnic table in 2 days. The first day he worked for 3 hours 45 minutes. The second day he worked for 2 hours 10 minutes. How long did it take him to build the table?

STEP 1 Add the minutes.

$$\begin{array}{r} 3 \text{ hr } 45 \text{ min} \\ + 2 \text{ hr } 10 \text{ min} \\ \hline \text{ min} \end{array}$$

STEP 2 Add the hours.

$$\begin{array}{r} 3 \text{ hr } 45 \text{ min} \\ + 2 \text{ hr } 10 \text{ min} \\ \hline \text{ hr } 55 \text{ min} \end{array}$$

So, it took Herman _____ to build the table.

Math Talk

MATHEMATICAL PRACTICES ⑧

Use Repeated Reasoning How is adding mixed measures similar to adding tens and ones? How is it different? Explain.

- What if Herman worked an extra 5 minutes on the picnic table? How long would he have worked on the table then? Explain.

  _____

  _____

🔑 Example 2 Subtract mixed measures.

Alicia is building a fence around the picnic area. She has a pole that is 6 feet 6 inches long. She cuts off 1 foot 7 inches from one end. How long is the pole now?

STEP 1 Subtract the inches.

Think: 7 inches is greater than 6 inches. You need to regroup to subtract.

6 ft 6 in. = 5 ft 6 in. + 12 in.

       = 5 ft _____ in.

$$\begin{array}{r} \overset{5}{\cancel{6}}\text{ft } \overset{18}{\cancel{6}}\text{ in.} \\ - \ 1 \text{ ft } 7 \text{ in.} \\ \hline \boxed{} \text{ in.} \end{array}$$

⚠ ERROR Alert

Be sure to check that you are regrouping correctly. There are 12 inches in 1 foot.

STEP 2 Subtract the feet.

$$\begin{array}{r} \overset{5}{\cancel{6}}\text{ft } \overset{18}{\cancel{6}}\text{ in.} \\ - \ 1 \text{ ft } 7 \text{ in.} \\ \hline \boxed{}\text{ ft } 11 \text{ in.} \end{array}$$

So, the pole is now _____ long.

Try This! Subtract.

3 pounds 5 ounces – 1 pound 2 ounces

Share and Show 📝 MATH BOARD

1. A truck is carrying 2 tons 500 pounds of steel. How many pounds of steel is the truck carrying?

Think of 2 tons 500 pounds as 2 tons + 500 pounds.
Write tons as pounds.

    2 tons   **Think:** 2 tons × 2,000 = ⟶   pounds

+ 500 pounds   _____ pounds   +   pounds

                                             pounds

So, the truck is carrying _____ pounds of steel.

Name _____

Rewrite each measure in the given unit.

2. 1 yard 2 feet

_____ feet

3. 3 pints 1 cup

_____ cups

✓ **4.** 3 weeks 1 day

_____ days

Add or subtract.

5. 2 lb 4 oz
 + 1 lb 6 oz

✓ **6.** 3 gal 2 qt
 − 1 gal 3 qt

7. 5 hr 20 min
 − 3 hr 15 min

Math Talk

On Your Own

Rewrite each measure in the given unit.

8. 1 hour 15 minutes

_____ minutes

9. 4 quarts 2 pints

_____ pints

10. 10 feet 10 inches

_____ inches

Add or subtract.

11. 2 tons 300 lb
 − 1 ton   300 lb

12. 10 gal 8 c
 + 8 gal 9 c

13. 7 lb 6 oz
 − 2 lb 12 oz

Problem Solving • Applications Real World

14. **MATHEMATICAL PRACTICE ③** **Apply** Ahmed fills 6 pitchers with juice. Each pitcher contains 2 quarts 1 pint. How many pints of juice does he have in all?

_____

15. **Sense or Nonsense?** Sam and Dave each solve the problem at the right. Sam says the sum is 4 feet 18 inches. Dave says the sum is 5 feet 6 inches. Whose answer makes sense? Whose answer is nonsense? Explain.

 2 ft 10 in.
 + 2 ft   8 in.

_____

_____

16. **THINK SMARTER** Jackson has a rope 1 foot 8 inches long. He cuts it into 4 equal pieces. How many inches long is each piece?

_____

🔑 Unlock the Problem *Real World*

17. Theo is practicing for a 5-kilometer race. He runs 5 kilometers every day and records his time. His normal time is 25 minutes 15 seconds. Yesterday it took him only 23 minutes 49 seconds. How much faster was his time yesterday than his normal time?

a. What are you asked to find?

_____

_____

b. What information do you know?

_____

_____

c. How will you solve the problem?

_____

d. Solve the problem.

_____

e. Fill in the sentence.

Yesterday, Theo ran 5 kilometers in a time

that was _____ faster than his normal time.

18. **GO DEEPER** Don has 5 pieces of pipe. Each piece is 3 feet 6 inches long. If Don joins the pieces end to end to make one long pipe, how long will the new pipe be?

Personal Math Trainer

19. **THINK SMARTER +** Ana mixes 2 quarts 1 pint of apple juice and 1 quart 3 cups of cranberry juice. Will her mixture be able to fit in a 1 gallon pitcher? Explain.

_____

_____

_____

_____

_____

Mixed Measures

Complete.

1. 8 pounds 4 ounces = ___132___ ounces

   Think: 8 pounds = 8 × 16 ounces, or 128 ounces.

   128 ounces + 4 ounces = 132 ounces

2. 5 weeks 3 days = _____ days

3. 4 minutes 45 seconds = _____ seconds

4. 4 hours 30 minutes = _____ minutes

5. 3 tons 600 pounds = _____ pounds

Add or subtract.

6.
```
   9 gal 1 qt
 + 6 gal 1 qt
```

7.
```
   12 lb  5 oz
 −  7 lb 10 oz
```

8.
```
   8 hr  3 min
 + 4 hr 12 min
```

Problem Solving Real World

9. Michael's basketball team practiced for 2 hours 40 minutes yesterday and 3 hours 15 minutes today. How much longer did the team practice today than yesterday?

10. Rhonda had a piece of ribbon that was 5 feet 3 inches long. She removed a 5-inch piece to use in her art project. What is the length of the piece of ribbon now?

_____

_____

11. **WRITE** ▸*Math* Write a subtraction problem involving pounds and ounces. Solve the problem and show your work.

_____

_____

_____

Lesson Check

1. Marsha bought 1 pound 11 ounces of roast beef and 2 pounds 5 ounces of corned beef. How much more corned beef did she buy than roast beef?

_____

2. Theodore says there are 2 weeks 5 days left in the year. How many days are left in the year?

_____

Spiral Review

3. On one grid, 0.5 of the squares are shaded. On another grid, 0.05 of the squares are shaded. Compare the shaded parts of the grids using $<$, $=$, or $>$.

_____

4. Classify the triangle shown below.

_____
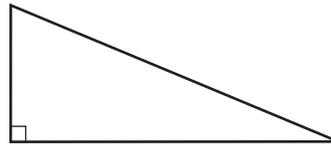
5. Sahil's brother is 3 years old. How many weeks old is his brother?

_____

6. Sierra's swimming lessons last 1 hour 20 minutes. She finished her lesson at 10:50 A.M. At what time did her lesson start?

_____

**FOR MORE PRACTICE
GO TO THE
Personal Math Trainer**